PREFACE.

WHETHER *the incloſing of Commons hath been a public advantage or not? is a queſtion that has been frequently diſcuſſed: Many arguments, both ſolid and ſpecious, have been advanced by the advocates on both ſides; and ſupported, as is commonly the caſe, in matters of an ambiguous or doubtful nature, by all the powers of rhetoric, and ſophiſtic eloquence; notwithſtanding which, the queſtion remains* in ſtatu quo, *without any general acquieſcence with either ſide.*

As, however, we find the practice of dividing generally prevail, we muſt take matters as they are, without entering upon any inveſtigation of the ſubject: The Author's ſole deſire, and wiſh is, to be in ſome degree uſeful, by the calculations, and ſubſequent reflections made thereon, in the following Eſſay.

When the diviſion of a Common is effected, there generally happen a good deal of buſtle and altercation between the landlords and tenants of the farms to whom the ſpecific ſhares of ſuch Common are allotted and annexed, in regard to the agreeing for the annual rents to be paid for the allotments, and upon the modes of cultivating the ſame; which often end in a total diſagreement between the parties, and frequently to the loſs and diſadvantage of both.

The nearneſs of the Author's habitation to a large and extenſive Common, now under diviſion, in the county of Durham, *gave riſe to the following*

lowing Eſſay; in which a particular regard is had to its ſituation with reſpect to lime-kilns, *in the article of liming in all the following eſtimates.*

As many valuable demonſtrations are derived by induction, the Author offers very little more by way of Preface; but will make ſuch reflections and remarks in the Eſſay itſelf as naturally ariſe from a joint conſideration of the eſtimates and modes of cultivation.

The Author intended to have given ſomething more diffuſe on the Art of Huſbandry, in the following Eſſay; but found himſelf almoſt entirely ſuperſeded, on that head, by Mr Clarke's True Theory and Practice of Huſbandry: *A work of the utmoſt importance to all true lovers of Agriculture; wherein the many and valuable new hints of improvement, and the ſubſequent practice are ſupported by a truly rational and philoſophical theory: The whole being delivered in well-ſupported dialogues,—a mode of inſtruction which affords the neareſt approximation to the energy of the precepts delivered by a living guide; and for which, the ingenious author ſtands highly deſerving of public applauſe.—Yet notwithſtanding ſuch obſervations and remarks are introduced here, as the locality of ſituation ſeem peculiarly to warrant the propriety of:*

With the words of Horace *I ſhall conclude a Preface,—much too long for ſo little a book,*

———Si quid noviſti rectius iſtis,
Candidus imperti: ſi non, his utere mecum.

Wolsingahm.

AN
ESSAY, &c.

PART I.

Containing Eſtimates of the Expences of cultivating Waſtes, *with Obſervations thereon.*

PREVIOUS to our eſtimates, we muſt ſuppoſe the allotment ariſing from the diviſion of a common, in right of an adjoining farm, to be annexed thereto, and let therewith, on the following terms and conditions, *viz.*

The LANDLORD

To grant a *leaſe* of not leſs than *thirteen* years, and to incloſe and *put up* the ſub-diviſion fences of the allotment.

The TENANT

To pay five ſhillings per acre, yearly, for every acre *taken up*, from and after the time of taking it up, to the end of the term.

To take up and cultivate every year, in ſucceſſion, ſo many acres, as that the whole may be under tillage in the courſe of five years.

To pare and burn the ſame, at the *breaking it up*.

To take no more than two crops between the fallowings.

To lay down to graſs, upon the firſt crop after the ſecond fallowing.

To lay down with ſound hay-ſeeds, and good artificial graſs-ſeeds, to the value of twenty ſhillings, upon every acre laid down.

To *tear out*, or convert into tillage, none of the land ſo laid down to graſs, without the landlord's conſent, &c. &c.

THE above may be the general heads, or minutes for a leaſe, ſufficient to ground the following eſtimates upon, without entering upon the *minutiæ* of agreement between landlords and tenants, which often vary exceedingly, according to the differences of circumſtances and ſituations.

WE ſhall now proceed to the eſtimates themſelves, taking for the

STANDARD, ONE ACRE.

Firſt Year's Expences, for a *Rye Crop*.

	£.	s.	d.
Rent —	0	5	0
Poor-ceſs —	0	0	3
Paring —	0	14	0
Burning, and ſpreading the aſhes	0	7	6
Liming (*i. e.* prime coſt, leading and ſpreading) 3. fothers) —	1	13	0
Plowing — —	0	7	6
Seed, 1 boll of rye —	0	7	6
Sowing, harrowing in, water-furrowing, &c. —	0	3	6
Total of firſt year's expences	3	18	3
Value of firſt year's crop —	3	0	0
Loſs the firſt year . —	0	18	3

Second Year's Expences, for an *Oat Crop*.

	£.	s.	d.
Rent and poor-ceſs —	0	5	3
Plowing —	0	5	0
Seed, 2½ bolls of oats, at 4s. per boll —	0	10	0
Sowing, harrowing in, &c.	0	2	9
Total of ſecond year's expences	1	3	0
Value of ſecond year's crop	1	15	0
Profit the ſecond year —	0	12	0

Third

Third and *Fourth Years' Expences:—Fallow* and *Rye Crop.*

	£.	s.	d.
Two years' rent, and poor-ceſs	0	10	6
Six times plowing, with intervening harrowings	2	2	0
Two fothers of lime, and laying on ———	1	2	0
Seed ———	0	7	6
Sowing, water-furrowing, &c.	0	0	6
Total of third and fourth years' expences —	4	2	6
Value of fourth year's crop	3	0	0
Loſs on the fourth year's crop	1	2	6

Fifth Year's Expences, on an *Oat Crop.*

	£.	s.	d.
Total expences, &c. as in the ſecond year —	1	3	0
Value of crop ———	1	15	0
Profit on the fifth year's crop	0	12	0

Sixth

Sixth and *Seventh Years' Expences: Fallow, Rye-Crop*, and to be laid down to *Graſs*.

	£.	s.	d.
Two years' rent, and poor-ceſs	0	10	6
Five times plowing, with proper harrowings —	1	12	6
Two fothers of lime, and laying on ——	1	2	0
Seed, ſowing, water-furrowing, griping, &c. —	0	8	0
Clover, and hay-ſeeds, with ſowing and rolling	1	1	0
Total of ſixth and ſeventh years' expences ——	4	14	0
Value of ſeventh year's crop	3	0	0
Loſs on ſeventh year's crop	1	14	0

Eighth Year's Expences: Graſs Crop.

Rent and poor-ceſs —	0	5	3
Stoning, and leading them off	0	1	9
Total expence of the eighth year	0	7	0
Value of graſs crop ——	1	10	0
Profit on the eighth year's crop	1	3	0

Ninth and *Tenth Years: Graſs Crops.*

	£.	s.	d.
I ſhall ſtate the profits on each of theſe years at	0	15	0

Eleventh Year: a *Graſs Crop.*

	£.	s.	d.
I ſhall ſtate the profit of this year, at — —	0	12	0

Twelfth Year: a *Graſs Crop.*

	£.	s.	d.
The profit of this year eſtimated at ——	0	10	0

Thirteenth and *laſt Year*: *Eatage* to *May-day.*

	£.	s.	d.
As the tenant will have the fog of the twelfth year's graſs crop, and the winter and ſpring eatage, for his thirteenth year's rent paying, —I ſhall call his profit	0	5	0

Abstract *of the Profits and Loſſes ariſing from, and falling upon this* Standard-Acre *of Common, during the Leaſe of* 13 *Years; and ſuppoſing an Acre to be* taken up *every Year, during the firſt* 5 *Years thereof.*

YEARS of LEASE.	Taken up 1ſt year.						Taken up 2d year.						Taken up 3d year.						Taken up 4th year.						Taken up 5th year.					
	Profit.			Loſs.			Profit.			Loſs.			Profit.			Loſs.			Profit.			Loſs.			Profit.			Loſs.		
	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.
1ſt year	0	0	0	0	18	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2d ditto	0	12	0	0	0	0	0	0	0	0	18	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3d and 4th do.	0	0	0	1	2	6	0	12	0	0	0	0	0	0	0	0	18	3	0	0	0	0	0	0	0	0	0	0	0	0
5th ditto	0	12	0	0	0	0	0	0	0	1	2	6	0	12	0	0	0	0	0	0	0	0	18	3	0	0	0	0	0	0
6th & 7th do.	0	0	0	1	14	0	0	12	0	0	0	0	0	0	0	1	2	6	0	12	0	0	0	0	0	0	0	0	18	3
8th ditto	1	3	0	0	0	0	0	0	0	1	14	0	0	12	0	0	0	0	0	0	0	1	2	6	0	12	0	0	0	0
9th & 10th do.	1	10	0	0	0	0	1	3	0	0	0	0	0	0	0	1	14	0	0	12	0	0	0	0	0	0	0	1	2	6
11th ditto	0	12	0	0	0	0	1	10	0	0	0	0	1	3	0	0	0	0	0	0	0	1	14	0	0	12	0	0	0	0
12th ditto	0	10	0	0	0	0	0	12	0	0	0	0	1	10	0	0	0	0	1	3	0	0	0	0	0	0	0	1	14	0
13th ditto	0	5	0	0	0	0	0	10	0	0	0	0	0	12	0	0	0	0	1	10	0	0	0	0	1	3	0	0	0	0
TOTALS	5	4	0	3	14	9	4	19	0	3	14	9	4	9	0	3	14	9	3	17	0	3	14	9	2	7	0	3	14	9

THE principal conditions of the leaſe, the *eſtimates* and *abſtract* therefrom being finiſhed; we ſhall now proceed to make ſuch remarks and obſervations, as naturally ariſe from an attentive peruſal thereof, and properly adverting to the ſubject.

On the CONDITIONS *between* LANDLORD *and* TENANT.

WE have ſuppoſed the landlord to have granted a leaſe (or ſome agreement equivalent thereto) of not leſs than *thirteen* years; and apprehend that the propriety of granting long leaſes will not be called in queſtion, as we ſhall more fully demonſtrate when we come to ſpeak on the abſtract of the eſtimates.

THE landlord, in all caſes of this nature, ought, at his own expence, to put up the *boundary-wall*, or *ring-fence* (as 'tis commonly called) of the allotment, as well as proper *ſubdiviſion-fences*, with all neceſſary gates, &c. And we likewiſe recommend to him, the opening of the *principal drains* therein, if any are wanted; which will not be attended with any very conſiderable additional expence; as theſe drains, and the *ſubdiviſion-fences*, may, in the *parcelling-out*, be made very often to coincide together; and 'tis univerſally allowed, that good and ſufficient draining is the principal ſtep that can and ought to be taken, in order to the improvement of ground: We alſo further preſume to aſſert, that a landlord may always let his ground, when effectually drained, at ſuch an advance of rent, as will in a very few years not only reimburſe him the ſum of money expended in ſuch draining, but a very handſome intereſt for the time it is out of his hands.

We make no doubt but the landlord will *win* as many ſtones as he conveniently can, for the building of the fences, &c. out of the ſubdiviſion incloſures, as they come in order to be cultivated; and that he will always compleat the fences of the incloſures, previous to the crops ſown thereon being in any danger of treſpaſs from cattle, without the tenants ſtipulating for ſuch neceſſary conditions.

The landlord would alſo ſhew his prudence, in the planting of irreclaimable bogs with *aquatics*; and the tops, &c. of dry, barren hills with very young firs, larches, or ſuch other trees as he might properly adapt to the ſoil: The advantages that in time would ariſe from plantations of this kind, in the ſheltering of the ground from cold, and *ſhaking* guſts of wind, as well as in yielding that valuable article, hedging ſtuff, are too obvious to need inſiſting on here.

LANDLORDS who have an eye to their own future advantage, or the intereſt of their poſterity, ſhould ſpare no coſt in the rearing of their quickſets till they become a proper fence, which would be much ſooner than is generally imagined, if proper methods were uſed: This *charge* ſhould never be laid on a tenant, (whoſe ſole aim will undoubtedly be his *own profit*) as it cannot be expected that he will take *one-tenth* of the pains that the treating of quickſets require, till they become a hedge; though at the ſame time, we think, that the landlord ſhould, by agreement, reſtrict the tenant to the taking as much care, as he poſſibly can, in preventing his cattle from making breaches, which in theſe ſort of fences are exceeding difficult, if not impoſſible, to put into their former condition.

WE ſcarcely need to point out here, the neceſſity of good barns, hemmels, ſtabling, &c. &c. being built on allotments, when they are ſo large as to require them: *Shelter* for cattle, and *barn-room* for corn, being of more importance in cold, periſhing ſituations, (ſuch as are all the commons in the North of England) than at firſt ſight appears; but there are ſtill greater advantages ariſing from *conveniences* in the centre of a large allotment, in the more ſpeedy getting in of the crops, the keeping of horſes, cattle, &c. &c. and breeding of manure nearer the grounds, on which it will always be *too much* wanted:—A farm-houſe and conveniences in the middle of a farm, may be looked on as a centre from which the rays of improvement proceed,—diverging in all directions.

In a very high ſituation, if other circumſtances conſpire, a gentleman may ſometimes make very good intereſt of the money laid out in building a *windmill*; as the number of horſes employed about a mill in carrying corn and flour, muſt needs produce a good quantity of manure, than which, in ſuch ſituations, nothing is more valuable.

On the part of the tenant, we have ſuppoſed him to pay a yearly rent of *five ſhillings* an acre for his allotment, from and after the *taking-up* thereof, to the end of the term; which, we preſume, will be found to be a very conſiderable rent for uncultivated *Common* land, though of a tolerable quality when covered with heath or ling (ſuch as that under ſcrutiny is ſuppoſed to be): As to the remaining part of the whole allotment, after the quantities to be yearly cultivated are taken off, and which every year decreaſes, the tenant has, in reaſon and juſtice, an undoubted right to the eatage thereof, in lieu of the *out-put* for ſheep and cattle, enjoyed by the farm before the diviſion was made; without paying any rent, or conſideration for the ſame; unleſs the farm itſelf will bear an advance of rent.—There are many ſituations where an *out-put* for ſheep, &c. &c. is of more value, than any annexed allotment will ever amount to, when reſtricted to a ſtate of tillage.

THE quantity to be yearly *taken-up*, we have ſtated in ſuch proportion, with reſpect to the allotment, as that the whole thereof ſhall be under tillage in the ſpace of five years from the commencement of the leaſe; yet, we ſuppoſe, that the landlord can have no objection againſt the tenant's taking it up in a ſhorter time, if he is of ability ſo to do; for, the ſooner it is improved, the greater will be the advantage to both landlord and tenant,—as the abſtract of the eſtimates will ſhew very clearly.

NOTHING need to be ſaid on the remainder of the tenant's conditions; for they are nearly compatible with the general tenor of leaſes in this part of the kingdom.

ALTHOUGH we have reſtricted the tenant to the above ſcheme of huſbandry, in the *breaking-up* and cultivation of *Common* land, when covered with *heath* or *ling*; yet we are very far from thinking it the moſt eligible one: Neither, in our opinion, can any certain mode of huſbandry be pointed out for the cultivation of commons, with the wiſhed-for propriety, prior to the commencement of the *breaking-up*; for the various kinds and gradations of ſoil which are oftentimes found, (even in a very ſmall incloſure) will point out to the intelligent farmer, as great variety, as well in the methods of *breaking-up* and *working*, as in the kinds of crops moſt ſuitable to be ſown thereon. In many caſes, the growing of rape or turnips may anſwer a better purpoſe than crops of corn; but in general, the moſt proper rotation and ſucceſſion of crops, with the adequate management of the ground, can only be known from an accurate examination of the nature and qualities of the ſoil, in conjunction with a thorough knowledge of practical huſbandry: And this ſuggeſts a wiſh, that ſuch an underſtanding may at all times ſubſiſt, between landlord and tenant, during their term of agreement, in regard to the moſt effectual cultivation of waſtes, (as well as of farms already in an improved ſtate) as will tend to their mutual advantage and profit.

We would not be underſtood, by the tenor of the above, to ſolicit for a tenant an unbounded liberty to do as he pleaſes in the management of his farm; ſuch liberty being exceedingly irregular, and would, in almoſt all caſes, be made an undue uſe of; our meaning is, that the judicious landlord, upon proper application of the tenant, ſhould grant him ſuch liberties, and conſent to ſuch alterations in any ſcheme of huſbandry that they ſhall have previouſly agreed upon, in regard to the cultivation and courſe of crops, as might tend to their joint emolument, by the *well-doing* of the tenant, and the more effectual improvement of the landlord's waſte.—Regular conditions are of the utmoſt importance, in every agreement of what nature or kind ſoever; and in none more ſo than in a leaſe of lands; for where ſuch have been wanting, we have too often ſeen the moſt irregular ſteps taken, and villainous practices committed by a waygoing tenant; ſuch as the tearing out of *freſh* land without the landlord's conſent, the laying of the manure on the *tillage* land, the *running* the tillage land out of *courſe*, the eating of the meadow land till May-day with more cattle than his own, and not *haining* the paſture ground in due time, the leaving the fences out of repair, &c. &c. &c. which oftentimes do the tenant very little good, and only gratifying a ſpirit of revenge, by prejudicing the landlord in the letting of his farm to another tenant.

On this part of our ſubject we ſhall, at preſent, only remark, that when a well-meaning and intelligent landlord meets with a judicious and honeſt tenant, and ſuch an underſtanding ſhall take place between them, as we have before pointed out, there need be no doubt but the cultivation of *waſtes* will go on in the moſt efficacious and profitable manner; yielding the higheſt ſatisfaction to every well-wiſher to the improvement of agriculture, and every friend to his country.

'Tis now time to proceed to the

OBSERVATIONS *on the* Eſtimates *and* Abſtract *thereof*.

STANDARD, one Acre:—*Firſt Year's Expence: A Rye Crop*.

RENT.

THE rent is ſtated by the leaſe or agreement.

POOR-CESS.

THIS is laid after the rate of one ſhilling in the pound, which, we believe, is pretty near upon *par*.

PARING.

THIS article is ſtated at fourteen ſhillings per acre, which we have known to have been paid for the paring of very large tracts of common: Indeed, in ſome caſes, it may be done at a good deal leſs; yet we cannot, with propriety, call it any leſs here; for the great quantity of work of that kind to be done in the ſeaſon, makes workmen ſcarce; and in droughty ſeaſons, and on dry, ſtony ground, the difficulty of executing this *capital* operation is very great; and we would moreover recommend it to the attention of the farmer, to ſee it well done; for there are often great advantages taken by workmen, when they are either too much abridged in their prices, or not properly looked after when doing their work. But faults of this kind may be greatly obviated, by giving parers a ſufficient price for their work; and then the owner has an undoubted right to inſiſt upon its being well executed.

BURNING, *&c.*

THIS is a little difficult to aſcertain with certainty:—The *medium prices* that we know to have been paid for burning only, were 4s.—4s. 6d. and 5s. per acre; which were all prices ſufficient, according to their reſpective circumſtances; viz. long heath and *ling*, and a droughty ſeaſon: When the *ling* is ſhort, and the ſeaſon proves very wet, we have known double, nay ſometimes triple the above prices inſufficient for the purpoſe; and therefore preſume, the ſum we have ſtated this article at, will be, in general, below *par*.

LIMING, *&c.*

THIS article will be found low enough ſtated, by thoſe who have already uſed it on the common; for which we have more particularly adapted our eſtimates. And here we may remark, that where a divided common lies within a moderate diſtance from lime-kilns, the mutual advantage of landlord and tenant will be very conſiderable; as this article cuts a very formidable figure in the eſtimates.

PLOWING.

THIS article cannot well be ſtated at leſs than 7s. 6d. For the difficulty of a firſt plowing is very great, owing to the hardneſs of the ſoil, the ſtones too often concealed in, and throwing out (nay oftentimes breaking) the plough; all which interruptions and misfortunes are attended with great loſs of time, and expence in repairs:—The farmer ſhould, for this ſort of work, keep always two or three ploughs in proper repair and readineſs, in order to ſave as much time as may be from being loſt, when ſuch accidents fall out. And here we muſt remark, that good plowing is a moſt eſſential article in the breaking up of commons; and recommend it to the farmer's attention, in caſes where he lets any part of it to be done by the acre, to give a good price, and ee that his work is compleatly done:—We

C have

have known, in many caſes, where plowing was let by the acre, that the work was moſt ſhamefully done by the raſcals who undertook it, to the great loſs of their employer; as will be more clearly ſhewn in the ſequel of this Eſſay.

SEED, SOWING, *&c.*

THE farmers will readily allow theſe articles to be low enough ſtated.

ON the articles of expence through all the other eſtimates, we ſhall ſay nothing; for, from experience, we can aver their truth.

THE values of the crops come next to be conſidered, which we are very doubtful of having rated too high; for if the crop on any ſubdiviſion-allotment be ſtated according to the eſtimate we have given for our *ſtandard-acre*, the reſulting value will be more than the intrinſic value; as will appear more clearly from the following articles of deduction, ſome one or more of which are met with in every ſubdiviſion-allotment, and leſſen its quantity.

1. THE ſpaces occupied by irreclaimable bogs or drains.

2. PLACES, out of which ſtones have been won, or (what is worſe) where large ſtones lie upon, or juſt within the ſurface, hindering the plough.

3. THE ground where old hedge-caſts have ſtood. Theſe old caſts are very common on waſtes, and are attended with expence to the farmer, in ſpreading down, which we have forgotten to make any allowance for in the firſt year's eſtimate: Theſe places may be eaſily diſtinguiſhed for many years after cultivation, as producing little or no corn or graſs.

4. ALL ſubdiviſion-incloſures are accounted at the number of acres included within their circumſcribing lines on a plan; but the fences or walls, gutters, &c. leſſen ſuch quantity.

MANY hazards attend the winning of crops of corn, on bleak and barren waſtes; ſuch as *high* autumnal winds, ſhaking out very often the beſt of the grain; but more frequently from the coldneſs of their expoſure, retarding their *ſeaſonable* ripening; in both or either of theſe caſes, the loſs attending is very great to the farmer; he having neither corn fit for the market, nor good food for his working-horſes, beſides the diminution of quantity.—Laſt harveſt affords us a melancholy inſtance of the truth of the above obſervations, as the quantities of bad grain (brought from high and cold expoſures) manifeſtly ſhew.

In the values of the graſs-crops, we are apprehenſive of having rated them too high; for repeated obſervations have ſhewn us, that improved waſtes, though laid down to graſs with the very beſt kinds of ſeeds, and after the greateſt pains have been taken in their previous management, very ſoon degenerate into a very poor and almoſt barren ſtate; owing to the coldneſs of the ſituation, thinneſs of the ſtaple of the ſoil, and an almoſt total want of the neceſſary ſuperinduction of rotten dung.—It is remarked by many judicious improvers, that where lime has been uſed pretty liberally during the ſummer-fallowings, when under cultivation, the ling has been longer in appearing, and the graſs has continued longer of a better kind, and more valuable: We have ſeen a very great improvement made on very poor *Common land*, by a continual *paſturing* of it, after being well laid down to graſs, without any corn having been ſown on it during its cultivation.

We come now to conſider the abſtract of the eſtimates, from whence we may gather the following concluſions:

1. If the tenant is of ability to *break up* the *whole* of his Common in the number of years undermentioned, and has liberty ſo to do, his profits would be as they ſtand in the right-hand column, viz.

			£.	s.	d.	
In 1 year	profit on an acre		1	9	3	For a leaſe of 13 years.
2 ditto	ditto	—	1	6	9	
3 ditto	ditto	—	1	2	7	
4 ditto	ditto	—	0	17	6	
5 ditto	ditto	—	0	8	5½	

The ſlighteſt view of the ſums above ſhews the advantage to a tenant, on a ſpeedy breaking up, more clearly than we could, by words only, expreſs it.

2. The profits above aſcertained are far too little, even on the moſt ſpeedy cultivation, when the great hazards of *ſhake* winds, *late* and *wet* harveſts, &c. &c. are conſidered; we therefore ground a very reaſonable petition on behalf of the tenant, and ſupplicate the landlord to grant him a year of *grace*, on the *breaking up* of every quantity, as yearly ſtipulated; that is, in plainer terms, not to inſiſt on any rent for the firſt year's crop after breaking up.—Juſt as we were writing this, we had the pleaſure of hearing that a certain neighbouring gentleman of great property on the common all along referred to, intends to grant his tenants this indulgence. *Plaudite! Plaudite!*

3. If theſe profits are in no degree adequate to the hazards attendant on ſuch undertakings, as we have above in other words aſſerted,—how can the farmer obtain a livelihood ?—This queſtion ſeems to ariſe ſpontaneouſly; and the anſwer is exceedingly obvious, viz. from his own labour, and that of his working-cattle; to which we may add the advantage ariſing from the antient farm (to which this allotment of *waſte* is annexed) being ſomething under *rack-rent*; and it is upon the exiſtence of this latter circumſtance, that his only ſolid hope of a livelihood ought to depend.—We cannot here ſuppreſs a wiſh, that the landlord would, in certain caſes, make the tenant ſome allowance for lime; as ſuch indulgence would certainly act as a ſtimulative to his induſtry, and co-operate with the intention of reducing the articles of expences in cultivation, more within the compaſs of the laborious farmer and his horſes.

That this reaſoning and ſolicitation on the behalf of the tenant, may appear more ſolid and rational, we (who farm a good deal, and may be juſtly ſuſpected of partiality to our brethren) appeal to thoſe worthy gentlemen who purchaſed the ſeveral tracts that were ſold on L——— Common, for defraying the expences of diviſion, &c. and who, by dear-bought experience (in the im-

improving of theſe bleak and barren tracts of waſte, unconnected with antient improved farms) can, if they chuſe, juſtify its force and propriety; nay their *bleeding* purſes, if they could ſpeak, (as ſticks and ſtones did in the days of old daddy Æſop) would ruſh on as anxious witneſſes to corroborate the evidence of their maſters.

As we have happened to mention the tracts that were ſold on L——— Common for the defraying of attendant expences, we beg leave thus publicly to applaud thoſe worthy gentlemen who were the purchaſers, for the great pains they have taken, the vaſt ſums of money they have expended, and the ſpirit of improvement they have manifeſted in the buildings, fences, and cultivation of thoſe dreary tracts of waſte; and we moſt ſincerely wiſh, that they may obtain therefrom *only* ONE-HALF the intereſt for the money expended thereon, that in reaſon and juſtice they ought to have.

ALTHOUGH the money ariſing from the ſale of theſe tracts of the common above hinted at, was far from being adequate to the purpoſes intended by the act; yet theſe ſales have anſwered a very valuable end, in eaſing the proprietors of the bulk of that enormous load of expences that generally attend diviſions; and have conſequently given vigour to the proprietors (the *poor ones* eſpecially) in the *breaking-up*, and puſhing the improvements on their ſeveral allotments, at a more early period than has generally been practiſed on the diviſion of other commons; and even long before there is any probability of executing the award of the commiſſioners.

We ſhall now paſs on to the moſt dreadful check upon the farmer's induſtry, and diſcouraging circumſtance to agriculture in general, viz. *Tithes in kind*; but on this head we ſhall not ſpend much of the reader's time; as the impropriators of *tithes* on the diviſion of many commons (eſpecially where they agreed with, and joined the proprietors in their application to parliament for the acts) have had allotments ſet off in lieu of their tithes: Yet there are ſeveral tracts of waſte now under improvement, in the North of England, where tithe is a *bone of contention*; and we cannot help, in this place, rendering the tribute of praiſe juſtly due to our ancient legiſlators, who, in the reign of King Edward VI. had the advancement of agriculture, particularly in the improvement of foreſts and waſtes, ſo much at heart, as to frame and obtain an act for exempting from tithes, all *barren grounds* for the firſt *ſeven* years after their *breaking-up*; and of which, to give the reader a more clear idea, we ſhall quote the two principal clauſes of that act, with ſuch readings and obſervations thereon, as we find in the *Eccleſiaſtical Law* of that judicious and uſeful compiler, Dr Burn, *viz.*

—"*By the ſtatute of the 2d and 3d* Ed. VI. c. 13. *All ſuch barren, heath, or waſte ground, other than ſuch as be diſcharged from the payment of tithes by act of parliament, which before this time have lain barren, and paid no tithes by reaſon of the ſame barrenneſs, and now be, or hereafter ſhall be improved and converted into arable ground or meadow, ſhall, after the end and term of ſeven years next after ſuch improvement fully ended and determined, pay tithe for the corn and hay growing upon the ſame.*

"*Provided, that if any ſuch barren, waſte, or heath ground hath, before this time, been charged with the payment of any tithes, and the ſame be hereafter improved or converted into arable ground or meadow, the owner thereof ſhall, during the ſeven years next after the ſaid improvement, pay ſuch kind of tithe as was paid for the ſame before the ſaid improvement.*"

BARREN.

ALTHOUGH it doth yield ſome fruit, and do pay tithes for wool and lamb, or the like, yet if it be barren land as to agriculture or tillage, which this clauſe meant to advance, it is within this act. 2 *Inſt*. 655.

But yet if the ground be not apt for tillage, yet if it be not of its own nature barren, it is not within this act. As if a wood be ſtubbed and grubbed, and made fit for the plough, and employed thereunto,—yet it ſhall pay tithes preſently; for wood-ground is fertile, and not barren. 2 *Inſt*. 656. *Bunb*. 159.

In the caſe of *Stockwell* and *Terry*, July 14, 1748, it was held by Lord Hardwicke, that ſuch land only is within this clauſe, as above the neceſſary expence of incloſing and clearing, requires alſo expence in manuring, before it can be made proper for agriculture; and he decreed tithe to be paid, on its being proved that the land bore better corn than the arable land in the pariſh, without any extraordinary expence of manure. 1 *Vezey*, 115.

In a prohibition between *Sharington* and *Fleetwood*, *H*. 38 *Eliz*. for tithes in *Orwell*, in the county of Lancaſter, it was reſolved, that if marſh, meadow, or other land, for not cleanſing of the trenches or ſewers, or by ſudden accident or inundation of waters, be ſurrounded; or by ill huſbandry, or unprofitable negligence, any land become over-run with buſhes, furſe, whins, and briers; yet are not they, or any of them, ſaid to be barren land within this ſtatute, becauſe of their own nature they are fruitful; and the parſon ſhall not by this act be debarred of his tithes, by the ill huſbandry or negligence of the owner or poſſeſſer. 2 *Inſt.* 656.

"*Shall, after the end and term of ſeven years next after ſuch improvement fully ended and determined, pay tithe.*"

NOTE, Here are no expreſs words of diſcharge of the tithes during the ſeven years; but by reaſonable conſtruction, it doth impliedly amount to a diſcharge during the ſeven years: And the ſeven years are to be accounted next after the improvement. 2 *Inſt.* 656.

THE trial whether lands are barren or not within the ſtatute, muſt be in the temporal, and not in the ſpiritual court: And therefore, in a ſuit for tithes in the ſpiritual court, if the defendant plead that it is barren land, and that plea be refuſed, or iſſue taken upon it, there a prohibition ſhall be granted. But a prohibition ſhall not be granted upon a ſuggeſtion only that it is barren land, before it be pleaded in the ſpiritual court. *Degge, p.* 2. *c.* 19. 1 *Keb.* 253.

A SLIGHT glance over the abſtract of the eſtimates (where it clearly appears that the farmer derives no profit for ſeveral years after the breaking up of *barren* waſtes) ſhews the great neceſſity of ſuch an *act*, as before-mentioned, being continued in force; for we may reaſonably ſuppoſe, (and indeed the beſt accounts we have of the origin of tithes warrant the ſuppoſition) that *tithes* were never intended as a tax on labour only, but as a moderate *quota pars* of the profitable crops raiſed by honeſt induſtry, for the decent ſupport of the clergy; who, for the faithful diſcharge of their ſacred function, are juſtly entitled to it: But alas! through the unexpected revolutions of time, the ancient ſtream has divaricated ſo far from its original channel, that were the ancient *fathers of the church*, the old *Saxon kings*, and other fabricators of tithes and tithe laws, now alive, they would be aſtoniſhed at the ſtrange perverſion of the well intended current. But to return:—According to the preſent ſyſtem of things, there is now a greater neceſſity than formerly, for a longer exemption from tithes on the firſt breaking up of waſtes, than the *ſeven* years limited by this ancient act; as will eaſily appear to any perſon who attentively compares the preſent prices of labour with thoſe at that ancient period; and it is with much pleaſure we mention an exemption from tithes for the firſt *twelve* years after the breaking-up of a common in Northumberland, granted by the late Sir W—— B——. How happy for the proprietors who were in the hands of ſuch a generous and humane (though *lay*) impropriator!

SUCH books of *reports* as we have peruſed (who pretend to very little knowledge in that *heterogeneous maſs*, the LAW) afford very few *caſes in point* reſpecting the legal deciſions of *tithe-caſes* on this act, which gives us reaſon to believe, that very few of that nature have heretofore been litigated; and leads us to hope, that the page of the induſtrious *reporter* will not in future be much *blackened* with the ſubject: But if the avaricious impropriators of tithe, under this predicament, on ſome northern commons, who are now threatening, ſhould actually commence *ſuits* againſt the proprietors for the recovery of tithes immediately upon *breaking-up*, we have no doubt of the *iſſues* being uniformly in favour of the latter; for if a loſs is ſuſtained by, or at leaſt no profit ariſes from the crops during the firſt ſeven years of cultivation, (which will undoubtedly be the caſe on three-fourths of the divided commons in the *North*) that *waſte* muſt, in reaſon and equity, be looked on as *barren*; and ſuch loſs or want of profit

fit conſtitutes the *criteria* of *barrenneſs*. And we are very ſure that every county in the North of England can furniſh *juries* of ſuch experienced abilities in the management of commons, as to be, *by dear-bought experience*, the moſt competent judges of the barrenneſs in queſtion. However we will hope, that the rich clergy, and other impropriators of tithes, will, by their lenity to the induſtrious cultivator, give us ground to plead ſomething in abatement from the poſitive plea of that arch ſatyriſt, *Juvenal*,

> *Creſcit amor nummi, quantum ipſa pecunia*
> *creſcit.*

So much for tithes.—We ſhall now endeavour to obviate an objection that may ariſe concerning the *five* ſhillings per acre which we have made our *ſtandard price*. There is no doubt but there are many parts of large waſtes that lie near towns and farm-houſes, or in valleys where they are well ſheltered, and where ſheep and cattle have grazed more than on the bleak and expoſed parts, which are worth perhaps ten or fifteen ſhillings per acre; but then there are much larger quantities than thoſe probably not worth *ſix-pence* per acre; ſo that upon an average, we hope we are pretty right: And here it will not be improper to remark, that many *bare* parts of commons where the veſtiges of ancient huſbandry are ſtill viſible,

ble, will not be ſo fertile as their external appearance might give room to hope for, owing to their having been entirely exhauſted when under tillage, and in that condition thrown down to graſs: The crops on theſe tracts of waſte having always been attended with great hazard to the perſon who had ſown them, from the pulling down of his fences, by other ill-natured proprietors, and laying them into common, to be deſtroyed by kyloes or ſheep.

We cannot conclude this part of our Eſſay, without ſincerely lamenting that more than *Egyptian* ſpirit of oppreſſion, which has, like an *epidemic contagion*, infected moſt of the landlords in this part of the kingdom, in the *unreaſonable* advancing of rents. Whether it originates from avarice, or from the inceſſant demands of exceſſive gaming, and the enjoyment of the modern expenſive luxuries and amuſements of life, we ſhall not at preſent enquire;—but we beg leave to offer an opinion of our own, concerning a circumſtance, which has, we believe, in ſome degree contributed to diſperſe the *poiſon*; and that is, the ill effect the writings of more than one of our huſbandry authors may have produced, who, in their eſtimates relative to crops, almoſt uniformly eſtimate the charge of labour too low, and make the imaginary produce too great*. Hence, their power to miſlead, and give

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* As we do not mean to make any ill-natured remarks, or beſtow any illiberal criticiſm on the works of any anthor, we have therefore choſen to give a large tranſcript from a writer who had the addreſs to procure a very handſome ſubſcription for his work in the northern counties.

Part of Chap. XIX.

"An eaſy method how to manage ſeventy-one acres of land, and to clear yearly for ever 139l. 16s.

" Were the ſeventy-one acres of land very good, the above profit would not be very extraordinary; but I am clear, nay poſitively ſure, that any ſtrong, coarſe land, which in nature is ſuitable for wheat, will bring yearly the above ſum, if it was not aforetime worth one ſhilling an acre; as, without doubt, it is poſſible to plow ſuch till it would bring a crop of onions. I lay the plan at ſeventy-one acres, viz. ſixty for the profit-crop, and eleven to maintain the four horſes; but however, this is only to proportion the thing.

" Therefore, I ſay, ſuppoſe a man have ſixty acres of barren land, no matter whether it be ſtubble or graſs, and that he himſelf was poor, or not willing to go to the expence of manure, let him divide the ſixty acres into two parts, thirty in each, let him provide four horſes, two ploughs, and two plowmen.

" Begin to plow one of the diviſions about Michaelmas, and keep ſaid two teams conſtantly going, to plow this thirty acres as often as they can in twelve months; begin always the next time to plow where they began the firſt: By this method they will plow it over once every month in the year, and by going the regular round there will be a month between every plowing; this ground being ſo looſe and mellow, that without doubt the two plows would plow the thirty acres in fifteen days.

" Being thus tilled, there is not the leaſt doubt but this land would bring as good a crop of wheat as could grow, and better than if it had been manured ever ſo high; a crop of this ſort without doubt would produce fixteen bolls on each acre, Engliſh meaſure.

" You ſee I have allowed five acres of graſs to graze four horſes, three acres for meadow, and three acres for oats, which allowance I am ſure is ſufficient to maintain four horſes well.

A

give falſe ideas to thoſe unexperienced landlords who may chance to read them; and

A Table of expence and profit of ſixty acres of wheat, managed, divided, and fallowed, as ſet forth in the remarks thereon.

	£.	s.	d.
Every farmer knows his own ſituation beſt, but I will ſuppoſe the land in a farming way, worth 15s. an acre, and as a crop of this wheat would have two years' rent upon it, it would amount to	45	0	0
To 12 bolls of ſeed wheat, at 10s. per boll	6	0	0
To reaping and binding, at 6s. per acre	9	0	0
To ſtacking, drawing home, and thatching, at 4s. per acre	6	0	0
To tithe, at 5s. per acre	7	10	0
To repairing plow irons	1	0	0
To two men's wages, at 9d. per day, through the year	23	8	0
To 11 acres of land to maintain four horſes; five acres for graſs, three for meadow, and three for oats	8	5	0
To mowing and making the hay, at 4s. per acre	0	12	0
To ſeed oats for three acres, and plowing and ſowing ditto	2	14	0
Mowing, binding, and carrying home	0	15	0
Total expence	110	4	0
To 480 bolls, ſold at 10s. per boll	240	0	0
Clear profit	129	16	0

Now, honeſt farmer, there's a profit for thee!—Who would be poor!—Didſt thou ever reap 16 bolls of wheat from an acre of bad land? No.—Canſt thou ſow 30 acres with 12 bolls of wheat? No; I doubt thou haſt not learned to plant corn yet:—Will the compaſſionate tither take 7l. 10s. for the tithe of a crop worth above 230l. an acre? I ſuppoſe not:—Will thy men work for 9d. per day through the year,—or can thy wear and tear be upheld for 5s. a horſe? Certainly no:—Thou wilt certainly buy an eſtate in time, farmer, when ſuch profits can be had from land only worth *one ſhilling* per acre:—*Commons for ever.*—*Riſum teneatis?*

and when ſuch landlords *rack* their tenants to an extreme, thoſe of more enlightened underſtandings too eaſily catch the flame, and ſo the conflagration becomes general.

'TIS alſo with regret we mention the little regard ſhewn by many landlords to *old* tenants, or thoſe who have contributed to the improvement of their eſtates; MORE RENT is the word, AND IF YOU WON'T, ANOTHER WILL! Whilſt it often happens, that the *tenant* who has taken no pains in improvement, is ſuffered to continue in his *old* way, by ſuch landlords as have not abilities to diſcriminate the qualities of the grounds under the hands of the *induſtrious man* and the *ſloven*.

WE beg the reader's pardon for not introducing in its proper place, an obſervation or two of the utmoſt importance to the farmer, (and which we hope will have due weight with the landlord) relative to the crops of oats to be grown a few years hence on *Wolſingham*, *Lancheſter*, and *Bulbeck* Commons:—It is very well known that the bulk of that article produced on *two* of the above-mentioned commons, (now under cultivation) is conſumed by the *collieries* in the pariſhes of *Lancheſter* and *Tanfield*; and when the other common, now under diviſion, furniſhes its *quota*, there is no doubt but the preſent prices will be very conſiderably leſſened: And we are authoriſed by a perſon of many years experience in theſe collieries, to acquaint our readers, that the average price of oats now purchaſed there is full eighteen-pence *per* boll leſs than it was *eight* or *nine* years ago; owing, 'tis more than probable, to the increaſe of quantity grown on theſe two commons immediately after their *breaking-up*, and now continued to be grown; for in theſe cold and barren ſituations the farmers cannot, by their utmoſt induſtry, procure crops of any other grain equal in value to thoſe of oats, and they too often extremely *bad*, owing to their *late* ripening, *bad* weather in getting them in, and ſometimes from *ſhake* winds carrying off the beſt of the grain.

AGAIN, with regard to the conſumption of oats at theſe collieries, the decreaſe will in a few years be very conſiderable, on account of ſeveral collieries now *winning* lower down the rivers *Tyne* and *Wear*, and which, in due time, will be caſting up coals: Now as the *vend* from theſe two rivers, taken collectively, is pretty near the ſame yearly, and no probability of any increaſe thereof, it is extremely evident that there will then be a very conſiderable diminution in the quantities now wrought at the preſent going collieries, on account of the *quotas* theſe new collieries will contribute to the annual vend: Add to this the decreaſe of conſumption by the waggon-horſes employed in the long *leads* from many of the preſent going collieries, which will be very conſiderable when compared with the ſmall number of waggon-horſes to be employed in leading an equal quantity of coals from theſe new collieries, whoſe vicinity to the rivers gives them many advantages which the more remote collieries cannot partake.

From theſe, and many more conſiderations of leſs moment that might eaſily be deduced, we preſume, that the prices of oats will be conſiderably leſſened in a few years; and this preſumption is grounded upon no ſelf-ſufficient opinion of our own ſagacity in peeping into futurity.—We ſhall now conclude this part of our Eſſay, with the words of *Horace*, altered to our preſent purpoſe,

Beware Farmer!

PART

PART II.

Containing Obſervations and Remarks on Turf-Aſhes *and* Quick-Lime; *they being the only Kinds of Manure procurable for improving* Waſtes.

AS the *paring* and *burning* of waſtes, covered with heath and ling, is found by experience to be the only proper method of breaking them up, and that no other operation is adequate thereto, in point of diſpatch and efficacy, in bringing them into a ſubſequent ſtate of cultivation,—we hope there is little need of apology for introducing the following obſervations on TURF-ASHES and QUICK-LIME, they being the only kinds of manure procurable for this ſpecies of improvement.

WE alſo preſume, that the reader will have no objection to look over the opinions of ſome of the ancient *Scriptores de Re Ruſtica*, as well as of thoſe of the moderns who have made Agriculture more peculiarly an object of their attention, and have endeavoured to reduce the rationale of *manures*, &c. to the teſt of chymical experiment; being very ſanguine in our expectation, that chymiſtry is the only art that will in future throw proper light on the buſineſs of the huſbandman.

'Tis worthy enough of remark, that all the theories of *phyſic* and *huſbandry* hitherto advanced, with reſpect to the *modus operandi* of medicines in the one art, and of manures in the other, lie under the ſame predicament of uncertainty and doubt, notwithſtanding the numerous volumes that have been written on both ſubjects; yet as there are ſpecifics in the phyſical art, ſo are there manures and modes of improvement in huſbandry, whoſe uniform effects, evinced by long experience, very juſtly entitle them to an equal degree of merit in the art of agriculture.

That *Turf-Aſhes* and *Lime* are the ſpecifics in huſbandry we have above hinted at, may be eaſily conjectured; therefore we ſhall immediately proceed with accounts of them in order, and

I. *Of* TURF-ASHES.

Virgil gives the following account of the burning of land and ſtubble:

Sæpe etiam ſteriles incendere profuit agros,
Atque levem ſtipulam crepitantibus urere flammis:
Sive inde occultas vires, et pabula terræ
Pinguia concipiunt; ſive illis omne per ignem
Excoquitur vitium, atque exudat inutilis humor;

Seu plures calor ille vias, et cæca relaxat
Spiramenta, novas veniat quà ſuccus in
herbas;
Seu durat magis, et venas aſtringit hiantes;
Ne tenues pluviæ, rapidive potentia ſolis
Acrior, aut Boreæ penetrabile frigus adurat.

VIRG. GEOR. *Lib.* I.

In *Engliſh:*

"Often too has it been of uſe to ſet fire to barren lands, and burn light ſtubble in crackling flames: Whether the land from thence receives ſecret ſtrength and rich nouriſhment; or whether every vicious diſpoſition is exhaled by the fire, and the ſuperfluous moiſture ſweats off; or whether the heat opens more paſſages, and ſecret pores, through which the ſap may be derived into the new-born herbs; or whether it hardens more, and binds the gaping veins, that the ſmall ſhowers, or keen influence of the violent ſun, or penetrating cold of *Boreas* may not ſcorch or hurt it."

THE above clearly ſhews that this practice, and the reſulting advantages, were known in the time of that *Poet*, though the operation itſelf does not appear; neither would it at this time be of any great conſequence to the reader; ſo we ſhall not hunt through any other of the ancient treatiſes, but come to the opinions of ſome of our own countrymen, more eſpecially ſuch as we are in poſſeſſion of.

From Norden's Surveyor's Dialogue: *London, printed* 1607.

"In *Devon* and *Somerſet*, and in ſome places of *Cornwall*, *Suſſex*, and in the ſouth parts of *Surry*, beſides their other commendable courſes of huſbandry, they burn their land, and call it in the weſt parts, burning of *Beate*, and in the ſouth-eaſt parts, *Devonſhiring*; and by that means in barren earth have excellent rye, and in abundance."

From Blith's Improver improved:—*London, printed* 1652.

After ſaying a good deal on the reclaiming of bogs, this old gentleman proceeds:

"I shall therefore adviſe, that this land be turved, or as ſome call it, denſhired, that is, all the haſſocks cut up, and the over-turf pared up, and all laid upon little heaps, till thoroughly dry, and then burned to aſhes; and if it be all ſtringy, rooty, and very combuſtible matter, then the thicker you pare it up the better; for although I differ from many of the weſt-country huſbands about this denſhiring their thin-turved lands, that are pure from roots, twitch, or moſs, conceiving (that though it bring their land into ſudden tillage, and to yield out its ſpirit the firſt year) it weakens the land much, there being no addition to it but a few buſhels of aſhes to an acre, inſtead of good turf or ſoard, that in a ſummer's working will be eaſily brought to tillage, and (as I believe) adds more, by far, to the fatting of the land than thoſe aſhes do; and I am ſure when any one layeth down his lands to graſs, upon this huſbandry, the ſoil comes pale and wan, and very lean and low, and never riſeth to a good crop; and whoſoever obſerves the ſame, ſhall find that very iſſue;—yet to lands of this nature (bogs) I as highly extol it, and to all ſuch foul lands, where is depth of ſoil enough, and all ſo combuſtible, as nothing elſe will work it into tillage. In the midſt of *May*, or any time in the very beginning of ſummer, when the land is thoroughly dry, is beſt, and the earlieſt alſo, that you may have as much of the ſummer as you can, to the working of your other tillages, which being burned in a dry ſeaſon, proceed to plowing and ridging up your lands, and dividing them into ſuch proportions as your drains will bear, they will then be fit to take the impreſs of any ſeed; much of this will bear cole-ſeed, or any grain, which I leave to the country experiences, only pray you ſtudy laying all ſound and warm; plow not too long, and lay it down to graſs either upon the oat ſtubble, which will ſoard exceedingly well the ſecond year, if not the firſt,—or upon wheat or rye, the land harrowed and laid very ſmooth; this will ſoard exceedingly the firſt year. And as your land recovers ſoundneſs, you will, by your improving your own experiences, have more talents added to theſe, you have more opportunities to raiſe new advantages out of them."

From Hartlib's Legacy of Huſbandry:—*London, printed* 1655.

" DENSHIRING (ſo called in *Kent*, where I only have ſeen it uſed, though by the word it ſhould come from *Denbighſhire*) is cutting up of all the turf of a meadow, with an inſtrument ſharp on both ſides, which a man with violence thruſts before him, and then lay the turf on heaps, and when it is dry they burn it, and ſpread it on the ground. The charge is uſually four nobles*, which the goodneſs of a crop or two repayeth."

THOUGH

⁎ This price of 1*l.* 6*s.* 8*d.* need not be wondered at, (although labour was performed very cheap, at the period of time when *Hartlib* wrote) for in *Blith*'s Huſbandry there are draughts of the *turfing* ſpades then in uſe; which are exactly like the hay-ſpades now uſed, with both their ſides turned up; but then they had handles exactly like thoſe of the hedging ſpades

THOUGH we meant only to give extracts (after that from *Virgil*) from ſome of our own countrymen; yet as Monſ. *Du Hamel*, a French author, has been ſomewhat diffuſe on the ſubject, we ſhall introduce the moſt material of his obſervations.

From Monſ. Du Hamel:—*Edit.* 1754.

Of BURN-BEAKING.

"WITH regard to lands which are ploughed up but once in eight or ten years, it is the cuſtom to burn them, to the end that the fire may divide the particles of the earth, and that it may be fertiliſed by the aſhes of the roots and leaves."

N. B. HIS method of paring was with hoes; an operation more tedious and expenſive than that of *Hartlib*'s, before adverted to.

HAVING deſcribed the operation very minutely, he proceeds, "When the furnaces (meaning the *heaps*) are cooled, they wait till it rains, and then ſpread the burnt earth as

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ſpades now in uſe, and were then uſed in turfing, it ſeems, pretty much in the ſame manner as a labourer would at this time uſe his hedging ſpade in cutting up a thin turf: So it is very evident that a parer at that time could not do more than *one-fourth* of the work that is now uſually done by the preſent paring-ſpade, as puſhed before the parer.

as even as poſſible, leaving none on the ſpots where the furnaces ſtood, which nevertheleſs will produce finer grain than the reſt of the field, for which reaſon they leave only ſuch turfs as are not burnt enough on theſe ſpots.

“They immediately begin to plow it very lightly, to begin to mix the burnt earth with the ſurface; but they go deeper in the following plowings.

“Some chooſe to ſow rye rather than wheat, becauſe the firſt production being very vigorous, wheat is more apt to be laid than rye.

“Some do not ſpread the burnt earth till juſt before the laſt ploughing for wheat; they content themſelves with ploughing well between the *heaps*, which they take care to ſet exactly in a line, in order to leave a free paſſage for the plough. But this is a bad method; for, ſince wheat is always apt to be laid the firſt year after burning, it is better to ſpread the burnt earth early before it loſes part of its heat, and for the convenience of well preparing the land; for it is very material that the burnt earth ſhould be perfectly well mixed with the ſoil.

“It muſt be owned that this method of burning is very expenſive, but it is very ad-

advantageous; for after this ſingle operation, the land is better prepared than it would be by many ploughings."

We ſhall give no more quotations from authors prior to this period, as they all harp pretty much upon the ſame ſtring, and tell us very little more than old Captain Blith has done; but ſhall proceed with the account of Aſhes, from ſuch authors as have conſidered them in a *philoſophical* and chymical light.

From Dr Home's Principles of Agriculture.

"Here we muſt claſs the burning of turf, or ſurface, which is often done to improve poor ſoil. Farmers think it acts by diſpelling a ſour juice which land has contracted from lying long untilled; and they chiefly preſcribe it for that ſort of poor ground;—for they all agree that it hurts rich ſoil. But I imagine, that the benefit ariſing from it is owing to the alkaline ſalt ariſing from burning the roots of vegetables; for farmers enjoin us to go no deeper than thoſe roots: And it is found, that the greater the quantities of roots, as happens in the land which has been long untilled, the more benefit ariſes from burning."

From Mill's Tranſlation of Gyllenberg's Elements of Agriculture:—*London, printed* 1770.

"MANY commend the *fixed alkaline ſalt*, and *unwaſhed aſhes*. In ſupport of this,

1. THEY appeal to the experience of both the ancients and moderns, quoting VIRGIL, COLUMELLA, PLINY, and others; ſeeing that is proved that the *natron* of the ancients was an *alkaline ſalt*. It is ſaid, that the *Engliſh* enrich their ſoils by mixing with *ſand* burnt vegetables and their *aſhes*. Others manure their land with burnt *liver-wort*, or with the aſhes of burnt wood, &c.

2. THEY boaſt of the large crops which are obtained from land where a wood has been burnt down. And

3. THEY plead that an *alkaline ſalt* is to be found in every rich ſoil, agreeable to HIERNE's and KIILBEL's experiments.

"To obtain a diſtinct knowledge of the uſe of *alkaline ſalt*, we muſt enquire into its nature, and from thence learn where it may be beneficial, and where hurtful to land.

1. *Alkaline ſalts are uſeful*,

a. IN attracting the moiſture and rich particles in the air, as alſo the acid, and in ſtrongly retaining them.

b. They diſſolve and attenuate the *oily, rich* particles in the earth, whence ariſes a ſaponaceous ſubſtance ſoluble in water.

c. They correct the acidity in the ſoil, and retain the moiſture, ſo that it cannot evaporate.

d. In ſo far as they prevent acidity, they help forward the fermentation which ariſes in the ſeed at germination.

e. They render tough ſoils looſer and more ſoluble, eſpecially if the unwaſhed aſhes are uſed. It muſt however be obſerved, that if they are applied in too great a quantity, they may become hurtful, by exhauſting at once the rich oily matter, and by being of a burning, hot quality; they therefore act in the ſame manner as lime, but are much ſtronger.

2. *Theſe ſalts become hurtful,*

a. By reſolving all the *oily, rich* particles in the ſoil, whereby they render it barren for ſucceeding years, as appears, among other inſtances, in places where woods have been burnt; for after this has been repeated a ſecond or third time, trees will ſcarcely grow.

b. They *heat* ſoils too much.

v. They render the ſeeds of plants *harder*, as other ſalts do. *Hence it appears*, that alkaline ſalts improve rich ſoils moſt when uſed with prudence; and on the other hand, that they are more hurtful to barren ſoils, and indeed to every ſoil, when too frequently or too freely uſed, than any of the other ſalts."

We ſhall now proceed to give quotations from ſeveral authors, on the other part of our ſubject, viz.

II. *Of* QUICK-LIME.

From Norden's Surveyor's Dialogue.

" In *Shropſhire*, *Denbighſhire*, *Flintſhire*, and now lately in ſome part of *Suſſex*, the induſtrious people are at a more extraordinary charge and toil. For the poor huſbandmen and farmers buy, dig, and fetch limeſtones, two, three, four miles off, and in their fields build lime-kilns, burn it, and caſt it on their fields, to their great advantage;—which kind of lime is of the nature of hot chalk, great helps to cold and moiſt grounds."

From Blith's Huſbandry:——" *Liming of Land.*"

" And firſt for liming, it is of moſt excellent uſe, yea ſo great, that whole countries,

tries, and many counties that were naturally as barren as any in this nation, and had formerly (within leſs than half an age) ſupply with corn out of the Fieldon corn country, and now is, and long hath been ready to ſupply them, and doth and hath brought their land into ſuch a poſture, for bearing all ſorts of corn, that on land not worth above one or two ſhillings an acre, they will raiſe (well huſbanded with lime) as good wheat, barley, and white and grey peaſe, as England yields; yea, they will take a parcel of land from off a *lingy* heath and common, *not worth the having*; nay many will not have it to huſbandry it, and will raiſe moſt gallant corn, that naturally is ſo barren, worth five or ſix pounds an acre.

Objection.

" And though ſome object it is good for the father, but bad for the ſon.

Anſwer.

" I anſwer, ſo are all extremes whatſoever, that is, to plow it after liming ſo long as is any ſpirit left in the lime, or heart in the land, or it will bear any ſort of corn or grain, it will ruin it for poſterity; but if that after liming, men would but ſtudy moderation in their tillage, and not (becauſe the land yields ſuch abundance of corn) plow or till it ſo long as it will carry corn,—no, nor ſo long as it will carry good corn: But if men would, after good liming, take three, four, or five crops, and then lay down their lands to graze, it would not be the leaſt prejudice; or if upon the laying of it down, men would but indifferently manure it,—or elſe upon the laſt crop you intend to ſow, dung it well before ſowing, and lay it down upon the rye or wheat ſtubble, it would produce a ſweet turf,—and, I am confident, would prove excellent paſture, as good again as it was before; but if after it is laid down, you would manure it once again, a little manure now will produce more fruit than as much more upon the old ſoard, it would be warriſhed for ever.

Preſidents for Liming.

"Many men have had ten crops of gallant corn, after one ſubſtantial liming; ſome more, upon very reaſonable land of about 6s. 8d. an acre, ſome land worth a little more, but more land leſs worth, and ſome upon land not worth above one or two ſhillings an acre, have got many gallant crops upon a liming as aforeſaid; ſome men have had and received ſo much profit upon their lands, upon once liming, as hath paid the purchaſe of their lands: I myſelf had great advance thereby,—yet I lived twenty miles from lime, and fetched it ſo far by waggon to lay upon my lands, and ſo not capable to make like advantage as other borderers.

The land moſt natural for Lime.

"The land natural and ſuitable for lime, is your light and ſandy land, and mixed, ſound earth; ſo alſo is your gravel, but not ſo good, and your wet and cold gravel is the worſt, except your cold, hungry clay, which is worſt of all, but all mixed lands whatever are very good."

The nature of Lime quite contrary to the common opinion.

"As for your lime, it is not of a hot, burning nature, as moſt men conceive, and do ſtrongly believe, and many have wrote: 'Tis true it is of a waſting, burning, and conſuming nature, before, or in the ſlacking or meling of it; and may be poſſibly in the meal or ſpirit of it; but in the uſe of it, and working it into and with the land and earth, and in the production of the fruit, it ſeems and appears to be coldeſt, and moſt fatning of land of any ſoil whatſoever, and that for theſe reaſons.

1. Because of itſelf it is of a heavy and weighty ſubſtance, and ſinks deep, and loſeth itſelf ſooner than any ſoil whatſoever; if you be not very careful in the

keeping of it up, and raiſing of it, you will loſe it before you are aware of it, or can ſuſpect it.

2. Because it ſo alters your lighteſt rye land, that though it be naturally ſandy and gravelly, that it never before would bear any thing but rye or oats, yet by one good liming it will be reduced to bear as good Lammas or red-ſtraw wheat, with barley and peaſe, as your ſtrong clay land.

3. Were it of ſo hot a nature, then it would have the beſt operation upon your coldeſt and wetteſt ſpewing land, upon which it hath none, and all experience ſhews the contrary.

How much will lime an acre?

"As I remember, about twelve or fourteen quarters of lime will very well lime an acre; you may alſo over-lime it, as well as under-lime it; alſo a mixture of lime, manure, and ſoil together, is very excellent, eſpecially for a few crops, and ſo lay down to graze, I conceive is beſt; but by any means till not long; for I ſay it is poſſible the land may yield corn, being ſo exceedingly in tillage, and ſo well wrought, as long almoſt as any earth is left in it. I have ſeen many parts tilled ſo long as there hath been little left but ſmall ſtones, flints, and pebbles:

bles:—A *mad cuſtom*, fly from it,—your lime will ſink downwards exceedingly, uſe all means poſſible to keep it as much aloft as you can, elſe you loſe it, and the benefit of it, and remember *it*, whatever you forget; and then you may plow and work your land, as you do with any other ſoil."

From Samuel Hartlib's Legacy of Huſbandry.

"Lime, which is made of divers ſorts of ſtones, is an excellent thing for moſt lands, and produceth a moſt pure grain: 160 buſhels are uſually laid on an acre; but I ſuppoſe that if men did lay but half the dung on the ground as they uſually do, as alſo lime and chalk, and dung and lime it oftener, it would be better huſbandry: For much dung cauſeth much weeds, and cauſeth corn to lodge; and too much *chalk* [we ſuppoſe chalk is printed, by miſtake, for lime] doth too much force the land, ſo that after ſome good crops, it lieth barren many years. It is good huſbandry likewiſe to lay down lands before they be too much out of heart; for they will ſooner recover;—otherwiſe not."

On conſulting the Philoſophical Tranſactions, we meet with very little on the ſubject of lime.—In No. 25, Dr *Liſter* ſays, "Liming of paſture ground makes it palatable to cattle: For, caſt lime over the one half of a paſture, the cattle will not bite any where elſe willingly, and will eat here to the bare ground, much neglecting the other half."

From Laurence's Syſtem of Agriculture.

Of Lime.

"It is not many years ſince *lime* was brought into ſo great repute, and become of ſuch general uſe in the way of huſbandry, and improvement of corn land. But it is now ſo well underſtood, and ſo much coveted, that the induſtrious farmer thinks almoſt no pains or coſt too much to procure it. But neither is the knowledge and the uſe of this become ſo univerſal as it ought; and therefore I ſhall briefly deſcribe its nature, and recommend its uſe, where it can be had at any tolerable eaſy rate, as being ſo noble an improver of tillage. Lime is commonly made of chalk, or of any ſort of ſtone that is neither ſandy, nor porous and cold, as freeſtone, &c. all ſorts of grey ſtone, ſuch as, if you break it, will yield a white powder; all ſorts of marble, alabaſter, ſlate, oyſter, and other ſea-fiſh ſhells; as likewiſe flints will make an extraordinary lime, though they be hard to burn: For the harder the chalk and the ſtones are, the better is the lime. All ſorts may be burnt with wood, coals, furze, or fern. And ſuch is the felicity of the county palatine of *Durham*, that through the very middle of the county runs a large vein of the beſt limeſtone in *England*, generally pretty eaſy to win; and at the ſame time the beſt coal in almoſt every part to burn it with. Chalk is commonly burnt in twenty-four hours; but the right limeſtone oft takes up ſixty. This laſt, as it is beſt for all other uſes, ſo it is obſerved to be beſt for land; chiefly for light, ſandy ſoils, or loamy, mixed gravels. It is carried upon the fallows in ſummer, and laid in ſmall heaps, till rain comes to diſſolve it; and then it is ſpread abroad. Some mix mud or freſh earth with it, and ſometimes cow dung; all theſe tending to fix and ſtay the ſalts contained therein. Thoſe that are moſt acquainted with the uſe of it, generally allow a hundred and fifty buſhels to an acre; but its nature being to work downwards, as chalk, it will not laſt above four or five crops; and therefore if there be any declivity in the land, it is adviſable to lay the ſubſtance of it chiefly on the upper part; for it will much of it ſoon waſh down to the lower.

" Of late years, many of the moors and waſte-grounds in ſome parts of the biſhoprick of *Durham* and *Northumberland*, that were thought cold, barren, and good for nothing, are now turned into arable land; and ſo far improved by lime and incloſures, that what was not worth above *one* ſhilling an acre, is now become worth *twenty*. And after having ſaid this, I think I need not add any thing farther to recommend the uſe of lime, although it ſhould be fetched eight or ten miles off."

From Monſ. Du Hamel.

"LIME is uſed chiefly on freſh broke up lands; after having ploughed them up not very deep, they lay on the lime in the manner following.

"They carry on the lime as it comes from the kiln; and lay about one hundred pound weight in a heap on every ſquare perch, ſo that the heaps lie at a perch diſtance from one another; then they raiſe the earth all round the heaps in form of ſo many baſins; the earth that forms the ſides of theſe baſins ſhould be a foot thick; and laſtly, they cover the heaps, half a foot thick, with earth, in form of a dome. The lime ſlacks under this covering of earth, and is reduced to powder; but then it increaſes in bulk, and cracks the covering of earth; if you do not carefully ſtop theſe cracks, the rain will inſinuate itſelf, and reduce the lime to a paſte, which will not mix well with the earth, or make a ſort of mortar, which will not anſwer the end propoſed. The farmers therefore are very careful to examine the heaps from time to time, and ſtop the cracks: Some only preſs the tops of the heaps with the back of the ſhovel; but this practice is ſubject to an inconvenience,—for if the lime is in a paſte within the heap, by this means you beat it ſo together that it will not eaſily mix with the earth; wherefore it is better to ſtop the chinks by throwing ſome freſh earth over the heap.

“ When the lime is thoroughly ſlaked, and reduced to powder, they cut the heaps with a ſhovel, and mix the lime as well as poſſible with the earth that covered it; and then having thrown it up in heaps again, leave it expoſed to the air for ſix weeks or two months; for then the rain will do no harm.

“ About the month of *June* they ſpread this mixture of lime and earth upon the land; but not all over, as may happen; on the contrary, they take it up by *ſhovelfulls*, and diſtribute it in little heaps at equal diſtances, on each perch of land; they obſerve that theſe little heaps promote vegetation more than if it was ſpread uniformly all over the field; and they don't mind leaving little intervals unlimed between each ſhovelfull.”

He then mentions the procedure for a crop of buck-wheat, but that grain being little known where we write, we ſhall paſs over that part of the ſubject, and come to what relates to our preſent purpoſe.

"In ſome new broken up lands they ſow no buck-wheat, but let it be fallow from the month of *March*, when it was firſt broken up, till *October*, when they ſow it with wheat; making uſe of the intermediate time to give it ſeveral ploughings; theſe lands by this means being much finer, they uſe little more than three-fourths of the quantity of lime above preſcribed, and generally have a better crop than when they begin with buck-wheat.

"Some farmers think a perch too great a diſtance for the convenience of ſpreading the lime; therefore they make the heaps leſs, and increaſe the number in proportion. Being perſuaded that lime is moſt efficacious when near the ſurface, they firſt plough it in, and then give it a ſecond ploughing before they ſow, by which means the lime lies chiefly near the ſurface.

"Others lay the lime in a ridge from one end of the field to the other; this diſpoſition is the leaſt trouble to ſpread."

WHAT we have already tranſcribed on the ſubject of lime, is from the writings of mere farmers,—or of thoſe who either did not underſtand, or never thought of its chymical properties; we ſhall therefore proceed to ſome tranſcripts from thoſe authors who are highly deſerving of public applauſe, for the pains they have taken on this head, in endeavouring at a philoſophical inveſtigation of the nature, properties, and uſe of this invaluable manure.

From Dr Home's Principles of Agriculture and Vegetation.

"CALCARIOUS ſtones, when burnt in a ſtrong fire, turn to Quick-Lime, a body much uſed in farming. It attracts acids much more than it did before, and is now in a ſmall degree ſoluble in water, without their aſſiſtance. It is not, however, on theſe ſoluble parts that its fructifying power depends; becauſe it has no ſenſible effect, except in killing vermin the firſt year, when theſe parts are moſt ſoluble in water. Lime is probably effete, and no longer ſoluble, when it begins to act on the ground, and aſſiſt vegetation. The lime of old houſes, which is quite effete, is reckoned better than freſh quick-lime.[1]

“ THERE is a very great attraction between quick-lime and all oily bodies; it unites intimately with expreſſed oils. With this intention it is uſed in the manufacture of ſoap, to help the junction of the alkaline ſalts and oils. It muſt, therefore, attract the oils powerfully from the earth and air, diſſolve them, and render them miſcible with water: it muſt, from this reaſon, ſoon exhauſt the ſoil of all its oleaginous particles, if the farmer does not take care to ſupply them by dung or animal ſubſtances. Farmers have, by experience, diſcovered it to be a great impoveriſher of lands, but they did not know how it acted. Its operation is, to exhauſt the earth of its oils. Lime laid on ground wore out by continual crops, rather hurts it than improves it; becauſe it does not meet with oil or oleaginous bodies to act upon, and blunt it. The proper cure for this is, to mix dung with the lime, ſo that it may have ſomething to act on.

“ LIME is a great diſſolver of all bodies, both vegetable and animal, but particularly the latter. We know how ſoon it diſſolves hair and woollen rags into a pulpy ſubſtance. This effect is ſo ſtrong, that, in the common method of ſpeaking, it is ſaid to burn them. In this way it certainly operates in the earth, by diſſolving all animal and dry vegetable ſubſtances, and converting them to the nouriſhment of vegetables; at leaſt ſooner than otherwiſe they would be.

"LIME powerfully reſiſts putrefaction, as is diſcovered by many experiments. It does not appear, therefore, very judicious to mix quick-lime with dunghills, which are not yet ſufficiently putrified, as it muſt ſtop that proceſs. When once that proceſs is finiſhed, many good effects may ariſe from their junction, and particularly that of hindering the oils to be volatilized, and of fixing them.

"IT is obſerved of lime, that it is continually falling downwards, ſo that, in a few years, the greateſt part of it is to be found lying together, as deep as the plough goes. This is owing to its great ſpecific gravity.

"IT is likewiſe obſerved by farmers, that lime has better effect on light ſoils than on ſtiff, for the firſt three years, but after that time its operation turns much weaker. Light ſoils are moſt pervious to the air; and as the good effects of all manures depend on the influence of the air, that influence muſt be ſtronger in open ſoils than in thoſe which are more compact; but as that ſoil has the looſeſt texture, the lime falls quickly through it."

"Besides, by mixing itſelf with the oleaginous particles of the ſoil, and converting them to the nouriſhment of plants, lime becomes in this ſenſe, a provocative to the ſoil. In promoting the work of vegetation, it will ſoon exhauſt all the oils of the light ſoils, which contain them but in ſmall quantity, and when they are all extraneous, for ſand can afford none. But a clay ſoil, containing in itſelf a conſiderable quantity of oil, and that not ſo eaſily ſoluble, is not ſo ſoon exhauſted. An addition of an animal or putrified vegetable ſubſtance to theſe light ſoils, would remedy this defect."

From Mill's Tranſlation of Gyllenberg's Elements of Agriculture.

"Lime abſorbs water poured upon it, and lets it ſpeedily paſs through; but in an extract made of it in water, ſomewhat of the lime is diſſolved in the water, thence called *lime-water*, which effervesces with the acids, and is a powerful ſolvent of *pinguid* and ſulphureous bodies.

"Experience teaches, that the mixing of lime with water *quickens their evaporation*, which may be imputed to the greater degree of heat which lime-water receives.

" By *diſtillation* lime by itſelf yields no ſalt; but if it is diſtilled with *water*, a *water* is obtained of a calcarious taſte, with ſome ſigns of an *alkali*.

" There is therefore in lime a ſomewhat *miſcible with water*, and which evaporates with it. This is very perceivable in new-built houſes, both by the ſmell and other effects.

" Lime effervеſces with acids when mixed with them, and abſorbs them, and if the maſs is diſtilled, an inſipid phlegm comes over. What remains after the diſtillation can ſcarcely be dried; ſo ſtrongly does it attract the moiſture of the air.

" No oily matter can be obtained from lime, either in extract or by diſtillation. It however poſſeſſes a ſtrong power of diſſolving every oily ſubſtance, eſpecially if water and warmth are added. There is even in it an attraction to ſuch ſubſtances.

" Lime attracts oily and gelatinous mixtures, and *coagulates* and *hardens* them when mixed with them. When mixed with clay or ſand, it likewiſe becomes hard, as every one knows.

" From the above account of lime, we may conclude, that it is beneficial to ſoils, FIRST, *Not materially*, ſince it contains nothing unctuous. Many are of opinion, that calcarious earths enter as nouriſhment into plants: But no ſuch earth has been found in any of the kinds of corn that are uſed for eating, nor in any of the ſmaller vegetables; and as to the calcarious earth which is obtained from the mere ſubſtantial vegetables, it is very different from either chalk or lime.

SECONDLY, It is however inſtrumentally of *uſe*, both to the ſeeds that are planted, and to the land:

FIRST, By attracting the *acid* and *oils* out of the atmoſphere.

SECONDLY, It gives a *greater warmth* to the earth and water, being ſtrongly attractive of every inflammable ſubſtance.

THIRDLY, It reſolves *unctuous ſubſtances* and *water* into vapour, by means of heat.

FOURTHLY, *Lime accompanies watery vapours*, and may by that means *enter into the ſeeds of vegetables*, and there reſolving *oily* particles, and deſtroying the *acid* in thoſe ſeeds, promote that *ferment* which is neceſſary in germination, to bring on a due degree of ſweetneſs.

Fifthly, It deſtroys and abſorbs the *acid* in the earth; and thus may deſtroy inſects, which harbour moſtly in acid earth: But whether it deſtroys *weeds* by this quality, we cannot ſay.

Sixthly, It reſtores *unctuouſneſs* to the land, and by attenuating its oily particles, renders them fitter for *mixing with the circulating fluids*.

Seventhly, *It renders the tilth of the land more eaſy*.

Remarks.

1. The late Dr Alston was of opinion, that lime-water does not afford nouriſhment to the roots of vegetables, nor promote the growth of plants; but this is to be underſtood of lime-water when uſed alone, without any other nouriſhing ſubſtance.

2. It has been imagined that lime takes away *ſmut*; which, if true, that effect muſt be deduced from the action of it: For *ſmut* does not proceed from inſects, but from a ſharpneſs of the oily particles, which burn as if fire had been applied; and therefore it is that the ſmut is *contagious*: For when this *ſharpneſs*, which ariſes from *acid*, is taken away, the diſtemper ceaſes.

3. It ſeems evident that lime is moſt ſerviceable in *cold* and *ſour* grounds, if uſed in proper quantity."

He then goes on to ſhew in what caſes the exceſſive uſe of lime is hurtful; but as that will ſeldom or never be the caſe where it coſts the farmer ten ſhillings per fother, we ſhall not trouble the reader with the tranſcript.

From Anderſon's Eſſay on Quick-Lime.

"Quick-Lime is a *calx*, or a very fine powder, obtained by burning marble, chalk, or limeſtone, and afterwards throwing water upon it.

"In common language, this powder is uſually diſtinguiſhed by the name of Lime ſimply: But, in the language of philoſophic preciſion, it is called Quick-Lime, ſo long as it remains ſoluble in water, and capable of being uſed as a cement. After it loſes this property, it is diſtinguiſhed by the name of *effete* lime.

"In either of theſe ſtates, it is employed by the farmer as a manure. And, as it is the manure of moſt univerſal utility that has yet been diſcovered, its nature and qualities deſerve to be very particularly inveſtigated.

“ If *limeſtone* be expoſed to the action of a pretty intenſe fire, for a ſufficient length of time, its colour is altered, and its weight conſiderably diminiſhed; but it retains its former figure and dimenſions.

“ In this ſtate of burnt ſtone, it is called in the counties of Durham, &c. *clod-lime.*

“ Limestone contains a very conſiderable proportion of *fixed air.* This is diſentangled from the ſtone, and diſperſed in the act of calcination; as has been demonſtrated by the very ingenious Dr Black, of Edinburgh, to whoſe Eſſay I refer the curious reader.

“ When *limeſtone* is thus deprived of its *fixed air*, it acquires many of the properties of ſaline bodies. It is in conſequence of this that it then becomes capable of being diſſolved in water,—is extremely acrid,—and acts moſt powerfully on many bodies upon which it has no ſenſible effect, while in the ſtate of *limeſtone.* And on theſe accounts the chymiſts have given it the name of cauſtic, when in this ſtate.

By way of note he adds, “ By experiment, the drieſt *ſlaked* lime, if pure, conſiſts of about equal parts of calcarious earth and water.” If *clod-lime* be expoſed to the influence of the air, without throwing water upon them, they quickly attract moiſture from thence, which ſlowly, and without any ſenſible heat, *ſlakes* the clods, and reduces them to powder.

"Still, however, the lime retains its *cauſtic* quality, even after its partial union with the water: But it as irreſiſtably, tho' more ſlowly, continues to abſorb the *air*, of which it had been deprived; and, without intermiſſion, perpetually tends towards that *mild* ſtate that ſeems to be natural to it.

"Hence, then, it muſt follow, that, in every caſe, *lime* is converted into the ſame ſtate with *limeſtone*, in a few days after it is mixed with the ſoil; ſo that, if it produces any effect at all as lime,—as a *ſaline* ſubſtance,—it muſt only be at the *very firſt* when it is applied; and it muſt act ever afterwards merely as *powdered limeſtone*.

"Pure *limeſtone*, when fully calcined and ſlaked, is reduced to a fine impalpable powder, that feels ſoft between the fingers: Such lime as contains ſand is never ſo fine, nor ſo ſoft.

"The lime from pure limeſtone is always of a bright white, when perfectly calcined,

cined, without a tendency to any colour.— When it has any colour it proceeds from the ſand in its colour.

" THAT the farmer may have under his eye at one time the ſeveral *criteria* of the purity of lime, they are as under :

1. IF the limeſtone loſes much of its weight in calcination, and the clods are extremely light.

2. IF the clods require a very large proportion of water to ſlake them fully.

3. IF it is long before they begin to fall.

4. IF the limeſtone is not apt to *run* (or be vitrified) in the operation of burning.

5. IF it falls entirely when it gets a ſufficient quantity of water after it has been calcined.

6. IF it ſwells very much in ſlaking, and if the lime is light, fine to the touch, and of a pure white,—he may be ſatisfied that it is extremely good ; and may uſe it in preference to any other lime that is inferior to it in any of theſe reſpects.

" WE know little certain about the mode in which lime operates, except that it acts merely in conſequence of its being mixed with the ſoil in ſubſtance.—If, then, lime acts upon the ſoil more efficaciouſly in conſequence of being intimately mixed with it, we may naturally conclude, that it will produce a more ſenſible effect when it is reduced to exceeding ſmall particles, than when it is applied to the ſoil in larger lumps, as theſe do not admit of being ſo intimately mixed with the particles of the ſoil.

"MUCH, however, depends upon the mode of applying the lime to the ſoil after calcination. If it is ſpread as ſoon as it is ſlaked, while yet in a powdery ſtate, a very ſmall quantity may be made to cover the whole ſurface of the ground, and to touch an exceeding great number of particles of earth. But if it is ſuffered to lie for ſome time after ſlaking, and to get ſo much moiſture as to make it run into clods, or cake into large lumps, it can never be again divided into ſuch ſmall parts; and therefore a much greater quantity is neceſſary to produce the ſame effect, than if it had been applied in its powdery ſtate.

"BUT if the ſoil is afterwards to be continued long in tillage, as theſe clods are annually broken ſmaller by the action of the plough and harrow, the lime muſt continue to exert its influence anew upon the ſoil, for a great courſe of years,—it will produce an effect nearly ſimilar to that which would be experienced by annually ſtrewing a ſmall quantity of powdered lime over the ſurface of the ſoil. But as the price of lime muſt, in the firſt caſe, be paid by the farmer altogether at the beginning, which only comes to be ſucceſſively demanded, in the other caſe:—This deſerves to be attended to, as it may become a conſideration of ſome importance where lime is dear, and money not very plenty."

We now cloſe our Extracts:—Having given what we think is the moſt material to be met with in huſbandry authors; and heartily congratulate *Scotland* on its acquiſition of learned and uſeful writers, on the ſubject of agriculture:—We alſo hope this ſmall tract will lead many of our readers to the peruſal of *Dr* HOME's *Principles of Agriculture and Vegetation*; *Lord* KAIM's *Gentleman's Farmer*; and Mr ANDERSON's *Eſſays relating to Agriculture*; which, with Mr CLARKE's TRUE THEORY OF HUSBANDRY, (before recommended in the preface) would form a compleat library of uſeful books of farming; and to which, for the many uſeful *theories*, *obſervations*, and *hints* contained in them, we ſincerely recommend ſuch of our readers as are not already too *ſelf-*

ſelf-ſufficient, to receive inſtruction from any perſon, though *ten times* wiſer than themſelves.

From theſe detached quotations on the ſubjects of *Turf-Aſhes* and *Quick-Lime*, and from what hath been determined by chymical experiments, we ſhall collect a ſet of Lemmas, wherein their properties and effects, both ſeparately and when conjoined together, will be rendered more obvious; and from whence we may, in a more regular and ſcientific manner, deduce rules for Practice.

We ſhall not trouble the reader with any account of the operation of *paring and burning*; it being, in general, ſo much practiſed in this country; but, any curious perſon may meet with a moſt minute detail thereof in the Marquis of Tourbilly's *Memoire ſur les Defrichmens* tranſlated in *Mills'* Huſbandry, and the Farmer's Dictionary.

LEMMA I.

Fixed alkaline ſalts are not obtainable in cloſe veſſels; nevertheleſs, vegetables burnt in the open air, ſo as to flame, yield leſs aſhes and ſalt, than if calcined with a cloſe, ſmothering heat.

REMARKS.

THIS *Lemma* points out the neceſſity of duly attending *ſod-heaps* (as they are called) when burning, and of *beating* them well up, and ſmothering the flame, wherever it happens to break forth, with freſh *ſods*, in order to the obtaining the greateſt quantity of aſhes, and conſequently of *alkaline* ſalt: —This work ought to be continued through the night, but is too often neglected, (eſpecially where the burning is done by the acre) and the heaps are ſuffered to blaze and burn out far too ſoon, to the great loſs of the owner, as well in the diminiſhing the quantity and value of his aſhes, as in leaving many ſods on every heap very little ſcorched with the fire.

IT is not meant that the work ſhould be continued in the night in the ſame manner as in the day; only, that one or two careful people (according to the quantity of work in hand) ſhould attend and cover up with freſh ſods all thoſe parts of the heaps where the flame is perceived to break forth; and a ſingle perſon may, during the night, attend as many heaps as ten or a dozen work people can ſet fire to in a day:—— This is a circumſtance that many gentlemen farmers have not attended to.

Such attendance on the *burning-heaps* is the more neceſſary, as ſhowers of rain frequently fall in the night at that ſeaſon of the year when the burning of land is moſt practiſed; and if the heaps are quenched before they are properly *burnt out* and covered over with pieces of unburnt ſods or ſoil, the few aſhes that are produced will be very much ſpoiled, and the ſubſequent expence (whether of breaking the ſods in pieces, or burning them over again) will be greatly encreaſed; but ſuch loſs of aſhes, expence, and diſappointment, may be in a great meaſure prevented by ſuch diligence and prudent management as before recommended.

LEMMA II.

If different degrees of heat be employed in the calcination of vegetable matters, their ſalts acquire different degrees of acrimony: The more vehement and laſting the fire, the more acrid the ſalt.

REMARKS.

The value of *alkaline* ſalts in huſbandry depends upon their ſtrength or acrimony; and if the degree of acrimony be in proportion to the intenſity of the fire during incinecineration, it is very plain that dry *whins*, or any other kinds of fuel, ſhould be got, if poſſible, and the utmoſt pains ſhould be taken in order to burn the ſod-heaps with a very violent fire.

Now, in a ſuitable ſeaſon, the intenſity of the fire depends on the ſize of the heap; but whether it would be more to the advantage of the farmer to burn his ſods in very large heaps, or in thoſe of a moderate ſize, we cannot with any degree of preciſion determine: For in the former caſe he would have fewer heaps, but more valuable aſhes, with reſpect to the acrimony of their ſalts; and in the latter, he would loſe the advantage that the ſame quantity of ground would receive by the burning of a greater number of heaps upon it; there being no fact more notorious, than that there is a very conſpicuous luxuriancy in a crop on thoſe *ſpots* of ground whereon heaps have been burnt; and, comparatively ſpeaking, thoſe ſpots are much more valuable than thoſe whereon aſhes have been ſpread even in the greateſt profuſion:—Hence, we are led to obſerve, that very great advantage ariſes, in this caſe, from the ſole action of fire*, which we ſhall not, at preſent, endeavour to account for.

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* *Old* HARTLIB *tells us, that a perſon at* London *in his time publiſhed propoſals for* Improving Land by HEAT only.

'TIS from this latter conſideration, we are induced to recommend, in the *ſcheme of management*, the ſpreading along with the aſhes and lime ſome of the ſurface of theſe ſpots of the ground wherein the heaps have been burnt.

LEMMA III.

Every vegetable matter, either putrified or decayed by being long expoſed to the air, is rendered utterly unfit for the purpoſe of obtaining ITS SALT.

REMARKS.

THIS *Lemma* points out the propriety of burning *ſods* as ſoon as poſſible after they are pared; and the great pains that ought to be taken in *turning* and *footing* them, in order to their more ſpeedy drying, ſo as to burn. For it is well known, that the ſooner herbs are dried, or hay is *won*, the more of their native virtues are preſerved; as, in that caſe, little or nothing goes off in exhalation beſides the aqueous parts: Hence the neceſſity of dry fuel to expedite the burning (as we have recommended in the remarks on laſt *Lemma*.)

By the removal of the *pared ſods* to the new plowed land, and *footing* them there, as recommended in the following *ſcheme of management*, their drying would be greatly forwarded, as the air would obtain much freer acceſs between the furrows of the plowed land, than it could have on the level ground where they were pared.

In caſe of rain, a great advantage would be derived from this new poſition of the ſods; for the water would ſink more readily into the ſeams between the furrows, than into the compact ſurface of the pared, but unplowed ground; and the whole would dry more ſpeedily, as may be eaſily ſeen, on comparing new and old plowed grounds when a breeze of wind ſucceeds a ſhower.

LEMMA IV.

The activity and virtue of alkaline ſalts are conſiderably promoted by being mixed with quick-lime; and the mixture becomes a moſt powerful diſſolvent of both animal and dry vegetable ſubſtances.

REMARKS.

On this *Lemma* we have grounded the 6th article of the following *ſcheme of management*-

ment, which preſcribes the moſt intimate mixture of the quicklime and aſhes after their being ſpread; and this can be no otherways effected than by well-timed harrowings after ſhallow plowings: Such *working* in a great meaſure ſeparating the roots of *heath*, *ling*, &c. from the ſoil, and drying and bringing them into contact with this corroding mixture, armed with ſuch power to diſſolve them.

The deſtruction of theſe roots, as abovementioned, is not the whole advantage to be gained by practiſing this mode of huſbandry; for the increaſed acrimony of the ſalt and quicklime will deſtroy the *acid* (commonly called the *ſourneſs*) in the ſoil, and form therewith a mild *neutral* mixture, favourable to vegetation.

Such mixture will alſo render the land much more eaſy to *work* during the remainder of the ſeaſon.

From hence, alſo, appears the propriety of carefully mixing *aſhes* or quick-lime, or both of them, with dung, (when it can be had) for the obtaining that ſaponaceous compound, ſo much extolled by ſome good authors as the *pabulum*, or food of plants.

The ingenious Dr *Home*, in his experiments on bleaching, has proved, by a number of curious experiments, that *Ruſſia* potaſh, which is by much the beſt of the potaſh kind, contains a large admixture of *quick-lime*. A moſt convincing proof of the truth of our *Lemma*.

Dr Percival obſerves, "that lime and the fixed alkalies are more powerful agents than neutral ſalts in preparing the food of vegetables, by their operation on the oils and mucilages which exiſt in the ſoil, and which have been ſupplied by manures, or derived from the atmoſphere."

LEMMA V.

Alkaline ſalts, expoſed to the air, moſt powerfully attract moiſture, and flow* per deliquium, *into a thick unctuous liquor.*

Remarks.

As the ſtrongeſt *cauſtics* attract the moſt water from the atmoſphere, (as is very evident from the expoſure of *Lapis Infernalis*, and other violent cauſtics to the air) and after their diſſolution, are longeſt in evaporating, on account of the tenacity or unctuoſity of the liquor they form with the ærial moiſture; we are thence led to conjecture (we hope with reaſon on our ſide) that the luxuriancy of crops, even in very droughty ſeaſons, where great quantities of *aſhes* have been ſpread, depends in a great degree on this property of attracting water, with which alkaline ſalt is endowed.

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* *One ounce of fixed* alkaline ſalt *will imbibe from the air near three ounces of water.* Boerh.

HENCE we have a rational theory for recommending the lime and aſhes in mixture, as their joint power of attraction (dependent on their acrimony) is rendered, by ſuch mixture, greater than the aggregate of their ſeparate attractions when applied to the ſoil at different times; and, conſequently, the benefit derived from their mixture will be much more than from their ſeparate applications, if any conſiderable ſpace of time intervene between the ſpreadings of the aſhes and lime.

LEMMA VI.

QUICK-LIME *acts as a moſt powerful diſſolvent when applied to either animal or vegetable bodies; and the attraction is very great between it and all oily bodies, forming with them a compound miſcible with water.*

RE-

REMARKS.

WE have nothing to offer on this *Lemma*, different from what has been already remarked in *Lemmas* IV. and V. And ſhall only juſt take notice, that quick-lime is applied with the greateſt ſucceſs on *foul* fallows, for the purpoſe of deſtroying *couch-graſs*, and *weeds*.

WHAT we have hitherto advanced, in the foregoing LEMMAS, on the ſubject of *turf-aſhes* and *quick-lime*, principally concerns their reſpective and joint operations, when applied to the ſoil in their cauſtic ſtate; from whence it appears, that the benefits to be derived from ſuch applications, when well timed and properly managed, would be very great: But the operation of lime does not end here;—for it is aſſerted by many very ingenious chymiſts and philoſophers, in conſequence of many obſervations and experiments, (originally pointed out by *accident*) that if limeſtone, as taken out of the quarry, could be, by any means, as minutely pulveriſed as it is by the operations of burning and ſlaking, and in this ſtate of impalpable powder applied to ſoils as a manure, the advantages thence derived would be adequate to what they are now known to be, when introduced into the ſoil after the moſt perfect burning and ſlaking:

But as there can be no methods pointed out for the powdering of limeſtones, or other hard ſtones, equal (in points of expence and diſpatch) to calcination, &c. theſe gentlemen ſtill recommend that ancient and well known operation.

Now, though we *chime* in with this opinion, yet we ſtill hold that *quick-lime*, applied to ſoils in its *cauſtic* ſtate, has thoſe powerful effects we have before (on chymical principles) attributed to it: But, at the ſame time, allow, that theſe effects ceaſe in a few days after its application to the ſoil; in which time it will have regained its fixed air, loſt its cauſticity, and become effete and harmleſs; notwithſtanding which, in that ſmall ſpace of time it will have operated in ſo ſpeedy and powerful a manner as to have deſtroyed weeds, attracted oils, and given to the ſoil a ſtrong bias towards fertility; and 'tis highly probable, from its mechanical action as a cauſtic, in attracting and combining with oils, water, &c. from the earth and atmoſphere, its innate and original property as a manure is conſiderably improved.

We ſhall make uſe of this opinion (relative to the permanency of lime as a manure, when *effete*, or *ſlaked and harmleſs*, and well mixed with the ſoil) when we come to make a compariſon between the ſcheme of management hereafter recommended, and the erroneous practice at preſent adopted by improvers, both gentlemen and farmers.

The reader will perhaps excuſe us for introducing here a few of the obſervations, above referred to, which gave riſe to the opinion of *powdered limeſtone* being equal in value, as a manure, to *quick-lime*.

"*Monſ. Du Hamel* was the firſt who, from accidental experiment, was led to believe, that powdered limeſtone was an equally efficacious manure as lime itſelf. He recorded the experiment as a great diſcovery.

"Having had occaſion to dreſs a marble chimney-piece*, for repairing one of his country-houſes, the maſon choſe a lawn near the houſe as the moſt convenient place for hewing the ſtone. After the operation was finiſhed, all the large chips were picked up and carried away, that they might not disfigure the lawn; but the fine powder that had been grinded off by the action of the chiſſel mixed ſo intimately with the graſs, that it could not be gathered up.—In conſequence of this very full dreſſing of *powdered limeſtone*, the graſs afterwards came up upon that ſpot with much greater luxuriance than on any other part of the lawn, and always continued to have a much livelier verdure.

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* *All marbles will burn to lime.*

"From hence he, with good reaſon, concluded, that *powdered limeſtone* might be employed as a manure with ſucceſs. To try if this would always be the caſe, he repeated the experiment ſeveral times, by cauſing ſome limeſtone to be powdered on purpoſe, and found that it never failed to promote the fertility of the ſpot on which he applied it, in a very high degree."

Mr *Anderſon* tells us, "that a mill, conſtructed on the ſame principles with an ordinary gunpowder mill, was erected by the honourable truſtees for managing the forfeited eſtates in *Scotland*, and that a good deal of limeſtone was pounded with it. But, as it was erected in the Highlands of *Scotland*, where roads were bad, and where there was but little ſpirit for improvements in agriculture;—as there was no public demand for the manure, after the experiment was ſufficiently tried to ſhew that it might be practiſed with advantage in other places, the mill was ſuffered to be unemployed.

Dr Home and Mr Anderson are of the ſame opinion, as appears from their accounts of lime; aſſerting, that it does not operate as a manure till it has imbibed its fixed air, and become *effete*:—To give more opinions of this matter here, would only tire the reader.

WE ſhall now proceed with our SCHEME OF MANAGEMENT for the effectual breaking up of *Commons*; and, by way of contraſt, will add the common method at this time uſed for that purpoſe in the counties of *Durham* and *Northumberland*; from which, we hope to draw ſuch uſeful obſervations, as may not only be of ſome ſervice to the unexperienced improver, but to the old practical farmer who has long *jogged on* in the hereditary path of abſurdity and error.

A SCHEME *of* MANAGEMENT,

recommended for the effectual breaking-up of COMMONS, *or* Tracts *of* WASTE LAND.

1. LET the *paring* be performed as ſoon as poſſible in the Spring.

2. PLOW the ground very ſhallow immediately after the paring, and let the ſods be regularly removed to the new-plowed land, as the plowing advances.

3. *Foot* the ſods when removed; and *turn*, *heap*, and *burn* them as ſoon after, and with as violent a fire as may be.

4. DURING the burning let the lime be procured, laid down in ſmall heaps, and ſlaked againſt the aſhes are ready.

5. LET the ſpreadings of the lime and aſhes go forward together, if poſſible; and let a part of the earth on which the heaps have been burnt, be ſpread along with the aſhes and lime.

6. MIX the aſhes and lime as intimately together as poſſible, with harrows, &c. &c.

7. PLOW acroſs, ſhallow as before, and repeat the harrowing, &c.—Plow and harrow as often as the ſeaſon will allow.

8. IF the intended quantity of lime has not been already got and ſpread with the aſhes, the remainder thereof may be very advantageouſly applied during the courſe of Summer working, when the ſoil is reduced to a proper TILTH.

9. THE STAPLE of the ſoil will guide the judicious farmer in regard to the depth of the plowings ſubſequent to the two firſt; and the degree of tilth procured by the

Summer's working, will lead to the moſt proper CROP under which it ought to be put.

The METHOD *moſt commonly practiſed in* BREAKING-UP *Commons.*

1. THE land is pared, and too often very badly (as we have already mentioned in the firſt part of this Eſſay):—The ſods are generally burnt in heaps; though ſometimes they are ſet fire to, and burnt as they are turned off by the *paring-ſpade:* Nay, the ling, heath, &c. in very droughty ſeaſons, are frequently burnt as they grow.

2. THE LIME is procured, and generally laid down in far too large heaps; where it is too often ſuffered to lie till the rains not only *ſlake* it, but even reduce it to a ſtate of plaſter, which is commonly called *dracking* it.

3. THE ASHES (after having been, in many caſes, too long expoſed to the weather) are ſpread:—The lime is *tumbled* in lumps over the ſurface:—The land then receives a *ſingle* plowing, the ſeed is ſown and harrowed in:—And thus finiſhes the *John-trot* ceremonial of modern management,

ment, as handed down in practice from father to ſon through many generations of b—ck—ds.

THAT the above injudicious method of procedure is at this time too much practiſed, common attention will eaſily evince; yet we can with pleaſure ſay, that there are *ſome* modern improvers who adopt practices much more rational and efficacious, but theſe are *Raræ Aves*, and not to be met with every day.

AS we now draw near the limits we have preſcribed ourſelves in this ſmall work; we ſhall therefore only take up a little more of the reader's attention with a few of the moſt obvious comparative remarks between the *mode* we have recommended for breaking-up Commons, and the above erroneous one, which, we are ſorry to ſay, is too much practiſed.

IN the firſt article we have recommended *paring as early in the Spring as poſſible:* This is on a ſuppoſition that the landlord and tenant make their agreement in the Spring; but it would be much more to the tenant's advantage to have matters, if poſſible, accommodated with his landlord in the latter end of the preceding year: For, in ſuch caſe, a great deal of paring might be got forward, the ſods removed, and the plowing performed during the *mild* and *open* part of the Winter; by which means the *thin* plowed ſwarth, in conſequence of the Winter's influence, would be ſo tendered, ameliorated, and *probably* enriched, that the ſucceeding Summer's work would be very greatly expedited; and in the courſe of the harrowings, (we have recommended) the roots and fibres of the *heath*, *ling*, *bent*, *moſs*, &c. would be ſo often brought into contact with the *aſhes* and *lime*, that they would, in a great meaſure, be deſtroyed by their *cauſtic* qualities.

INDEED it may be objected, with ſome ſhew of reaſon, that the ſooner ſods are pared in the Winter, the longer will be the time between their paring and burning; and, conſequently, the more damage they will ſuſtain by rotting, &c. contrary to the intent of LEMMA III. But if SODS were carefully *footed*, and duly attended, and ſet up when accidentally tumbled down, during the Winter, we believe they might be ſo well preſerved, as to obviate, in a very great degree, the force of this objection.

THE practice of frequent and *true* plowing, can never be too much inſiſted on:— And the ſuperior values of the crops obtained by frequent plowings over thoſe got from one plowing (as is commonly practiſed) will certainly, in time, pay well for theſe *extra* plowings; though all the advantages thence to be derived may not appear in the *firſt* crop:—For the land being reduced to good tilth before the firſt crop is ſown, the crop will be not only encreaſed thereby, but the land rendered capable of being wrought much eaſier for the ſucceeding crops; and alſo put into a much better ſituation for receiving the benefits of manure, lime, the atmoſphere, or any *ſuperinduction* that may be applied to it.

We have recommended the careful *ſlaking* and ſpreading of lime, as we have little doubt but *two* fothers of lime, in this manner applied to the ground, will, in effect, be equal to *three* fothers when applied *effete*, or *dracked* (as farmers call it): Although the operation of the *three* fothers may be looked on as more permanent; yet the large lumps tumbled, in plowing, to the bottoms of the furrows, and by that means getting below the reach of the plough, are many of them loſt in the barren ſtrata, to the great injury of the huſbandman.

'Tis the opinion of many authors, as well as of all farmers, that lime works downwards, by its ſpecific gravity, or weight:—But we look upon this doctrine as very problematical; for, when lime is carefully *ſlaked*, and in the ſtate of an impalpable powder, applied to, and intimately mixed with the ſoil, although its ſpecific gravity exceeds that of the ſoil, yet it cannot, in ſuch a ſtate, make its way through the ſoil, unleſs in a great length of time;—theſe fine particles being entangled, and their deſcent retarded by the tenacity of the ſoil, &c.

Now, on the other hand, when lime is ſpread over land in a *dracked* ſtate, and in great lumps, which having regained ſo much of their *fixed* air, become of much greater ſpecific gravity than the ſoil; they are conſequently, by the action of plowing in conjunction with their gravity, tumbled to the bottoms of the furrows, from whence, in ſucceeding deep plowings, theſe lumps are often turned up; and this appearance, we believe, gave riſe to the long eſtabliſhed notion of lime *working* downwards.

How contradictory to a rational theory muſt the common practice be, of ſpreading *dracked* lime, and *aſhes*, over the unſtirred ſurface of the ground, full of roots, and trodden hard with the feet of the work-people and horſes!—How can a good crop be expected from ſuch erroneous practice, (unleſs the ſoil be very rich indeed) when the lime and aſhes are turned down, at once, upon the under barren ſtratum, and all their virtues loſt, for want of *proper* mixture with the ſoil, except what is obtained by the turning over of the furrows in harrowing, and, as it were, *rolling* them a little in the lime and aſhes!

'TIS extremely evident, from what has been obſerved by Monſ. *Du Hamel*, &c. that finely powdered limeſtone, (or what is tantamount to the ſame thing, *ſlaked* and *effete* lime, if in the ſame ſtate of an impalpable powder) is a moſt valuable manure; although its manner of operation in producing that effect is not known, and may probably for ever remain one of the *Arcana* of Nature: It therefore behoves the farmer to be extremely cautious in having his lime, when effete, laid on in this ſtate of fine powder:—Now, if it ſhould happen, as it often does, in very rainy ſeaſons, and with the beſt managers, that the lime is *dracked*, and afterwards concretes into large lumps; quere, whether it would not pay well for the trouble, to break the lumps into as ſmall particles as poſſible, with a large wooden mallet, before it is *laid on?*—The inſufficiency of the preſent implements of huſbandry, (and in all likelihood ſuch as may be hereafter invented) to break and reduce theſe lumps into much leſs bulk than when they were ſpread, ſeems to warrant the propriety of an anſwer in the affirmative.

Add to this, the *dearneſs of lime*, ſhould ſtimulate every farmer and improver to make the beſt and moſt advantageous uſe they can of it.

We would caution the improver not to make too free in turning up the under *barren* ſtratum, during the Summer's working for the firſt crop; as uch management might be prejudicial:—The only time to do this buſineſs would be before Winter; and in theſe deeper plowings the land ſhould be ridged up, (as if ſet with potatoes) and in that ſtate ſuffered to lie during the Winter; by which means, the barren ſtratum would be *tendered*, and ameliorated by the froſts, &c. and by drying much ſooner in the Spring, would forward the neceſſary operations of that ſeaſon.

There are many tracts of common, which, on account of their bleak and cold expoſure, and the apparent barrenneſs of the ſoil, are not thought capable of bearing *hard corn*; but are pared, burnt, limed, and Summer fallowed, and in that ſtate lie through the ſucceeding Winter, in order to be ſown with oats or barley in the Spring: —Quere, whether *peas* ſhould not have a fair trial on ſuch kinds of ſoil?

As *hard corn* crops, on new *broke-up* land, eſpecially on *waſtes*, generally fail in many places after the *Spring froſts* (and which are called by the farmers *loppen-places*): Quere, whether the method recommended by Mr CLARKE, in his *Theory of Huſbandry*, of ſpreading the crowns or combs of the ridges over their ſkirts, in conjunction with prudent and well-timed *rolling*, would not be the moſt likely method of preventing this accident, and of remedying it, in ſome degree, when it has happened?—'Tis certainly worth the trial,—and the method of doing it may be ſeen in the above-mentioned work.

IT may, perhaps, be not amiſs to let the farmer know how to diſtinguiſh limeſtone, if he ſhould accidentally meet with it.—Pour upon the ſtone a little *aqua fortis*, or *ſpirit of ſea ſalt*, and there will immediately follow an *efferveſcence*, or *hiſſing*, *accompanied with froth or air bubbles*, if it is limeſtone:—And this method is accompanied with equal certainty, and far leſs difficulty than any other trial by fire, &c.

HAVING now gone through what at preſent occurs, on the ſubject of *Turf-Aſhes* and *Quick-Lime*, and hoping that we have ſet the doctrine of their application in a rational and ſcientific point of view; we ſhall, therefore, take leave of every candid reader, whether farmer, improver, or well-wiſher to improvement, with our beſt wiſhes for his ſucceſs in the *Cultivation of Waſtes*, a branch of the utmoſt national importance; and which, in the preſent critical ſituation of affairs, ought more than ever to be attended to,—leſt poor Old England, in future times ſhould have little other dependence than on her own internal reſources.

FINIS.

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